

Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. LXXIX.*

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,
Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal.)

(The Author reserves the right of reproduction.)

SECTION V.

Where it is desirable that the bearer shall not project above the wall pieces it will be necessary to notch the latter. The simplest method is to cut the underside of the cross bearer near its end, both horizontally and vertically, thus forming a vertical and a horizontal face. The wall piece has a rectangular notch cut in it to a depth equal to the amount of the horizontal cut in the cross bearer; the notch does not extend across the whole depth or thickness of the wall piece, but only so far as is necessary to receive the projecting portion of the end of the cross bearer, which rests upon the ledge formed by the lower end of the notch. A still better arrangement in the case of a great vertical pressure is to make the end faces of the bearer inclined, and in such a manner that the two end faces form the surfaces of a wedge. The notch, which must be cut to correspond, will then be deeper at the upper end than at the lower end, where it forms a horizontal ledge, and the cut in the bearer will be vertical. In the nomenclature hitherto used the end or head of the cross bearer will be inclined, the flat will be horizontal, and the cut will be vertical. Such a joint is usual not only with the cross bearers but also with the short side pieces, when the long wall pieces project beyond them, and are notched into the sides of the shaft.

Another modification of this kind of joint is formed when, in addition to the above notch, the wall piece has a notch cut quite across (over its whole breadth), the upper side just above and of the same width as the notch. When this description of joint is used the vertical notch in the wall piece seldom extends down half the thickness of the wall piece, and the cross bearer projects considerably above the wall piece. Where this joint is used for connecting the wall pieces with the side pieces the horizontal and vertical notches, which we have above supposed formed in the wall pieces, are usually formed in the side pieces, on which the long wall pieces rest.

Where the side pieces project beyond the wall pieces, and at the same time the wall pieces project beyond the side pieces, the joints are usually made as follows:—The two side pieces receive four saw cuts, the two inner ones being the same distance apart as the inner side of the wall pieces, and the two outer cuts the same distance apart as the outer sides of the wall piece. The timber thus enclosed between the two saw cuts at each end is split out, and the face thus formed is made smooth and horizontal. In like manner the wall pieces each receive four saw cuts, the two inner ones being the same distance apart as the inner sides of the side pieces, and the two outer saw cuts being the same distance apart as the two outer sides of the side pieces. The portion thus enclosed between the two saw cuts at each end is removed, and the face thus formed made smooth and horizontal. The depth to which the cuts are made will depend on whether the side pressure is very great, and if so from which sides, or whether the set has any great vertical weight to bear; and, lastly, whether it is necessary that the side pieces shall not project above the wall pieces. In this latter case the depths of the cuts should be such that the depth of the cut in the side pieces, plus the depth of the cut in the wall pieces, shall equal the whole depth or thickness of the wood of which the wall and side pieces are made. This, of course, supposes them to be of the same thickness. The most usual case is to make each cut equal to half the depth of the timber. Where, however, the set is intended to carry considerable vertical weight the cuts are not made so deep, and the upper faces of the side and the wall pieces are seldom in one plane.

When it is necessary, as may very often occur in sinking through swimming ground, that the frames (two wall pieces and two side pieces) shall be flush at their joints (that the upper surface of the wall pieces and the upper surfaces of the side pieces shall be in one plane, and likewise the lower surfaces in one plane, and that neither the ends of the side pieces shall project beyond the outer sides of the wall pieces, nor the ends of the wall pieces shall project beyond the outer sides of the side pieces) the following method of forming the joints is resorted to. The timber of which the frames are made is square, about 8 in., and of the same size for both the longer and shorter sides. The shorter pieces are cut on the inner sides at a distance from the end equal to the breadth of the longer piece, and about 2 in. The portion thus separated is split off, forming a vertical face. Afterwards a saw cut is made on the upper sides, at a distance of about 6 in. (less than the breadth of the lower pieces) from the ends and to about half the depth of the wood, and the piece so loosened is then split off, leaving a horizontal face. The ends of the longer pieces are then cut to correspond, and in the following manner:—At a distance of 6 in. from the ends the longer pieces have a saw cut on the inner and under sides, that on the inner side being about 2 in. deep, and that on the under side to half the thickness of the timber, about 4 in. The portions thus separated are split off, leaving a projecting rectangular piece at the upper outside corner, about 6 in. broad by 4 in. deep. This arrangement is especially suitable to resist a considerable pressure from the longer sides.

The jointing of shaft timbering by means of mortice and tenon is more usual than is the case in the timbering of levels; the same objections, however, to this method of joining hold good, though in a somewhat diminished degree; as, for example, the necessity of having the shaft considerably larger, in order to have space for the introduction of the piece which has the tenon from the side. The objections have less weight in the case of round than rectangular shafts, since in this case the timbering is placed more solidly (frame upon frame), and resists the pressure more from the surface of the timbers which are in contact than by means of the tenon. As a rule the tenon is formed on the shorter pieces, and the mortice on the longer piece, though where the frames are placed pretty close together it will be found advantageous to alternate the position of the tenon and mortice in the shorter and longer pieces. More generally the tenon is rectangular; occasionally it is made dovetailed. Not unfrequently the joining of two pieces of timber is effected by a combination of tenoning with some of the simpler scarf joints above described.

The method of joining timbering by simply allowing the ends of two pieces to bear against each other on a single surface is much more common in the case of shaft timbering than in the timbering of levels, &c.; this, however, requires to be effectual that the pressure on the timbering shall come from all sides, and also be pretty uniform, and hence it is chiefly used in sinking circular or polygonal shafts in loose or swimming ground.

The simplest case of timbering a shaft usually occurs when the two shorter sides require to be protected. This is done by placing stempels notched in the lying wall, and drawn tight down in the Anfall formed in the hanging wall. According to the more or less loose nature of the ground, and the probable pressure to be resisted, the stempels are placed at each side above one another at distances of from 30 to 40 in. apart, forming two vertical rows of stempels. Where the ground is liable to break off only in large pieces such a protection to the side may be sufficient, but where the ground is liable to break in shorter pieces, which might readily fall through the space between two stempels, the covering of the back of the stempels with covering wood, as we have described in the case of timbering the roof of a level, must be resorted to. This method of timbering is called side lining, and in order that it shall be properly and solidly finished the space between the lining wood and the

sides of the shaft must be well filled with attle packing, so as to avoid all risk of any motion of the ground, and a disadvantageous and dangerous motion or change in position of any part of the strata, as we here insisted upon on the case of covering in the roof of a level.

In the case where there is any probability of a great side pressure, and more especially where the stempels are laid so close together that in case a later replacing or renewal of any stempel is necessary, the stempel cannot be introduced or driven down, it must be introduced into position sideways from the side towards the middle. In order to do this, however, the space between the stempels and the sides of the shaft will require to be made somewhat larger, and they will consequently require to be all the more carefully packed with attle.

The protecting of two sides of a shaft only is a case which occurs more rarely than that of covering all the four sides. In this latter case the main timbering will consist of two shorter side pieces, connected to two longer wall pieces by any of the joints we have above described. Four such timbers when connected together form a sort of frame, technically termed a crib, or set, and correspond to a door-set mounted on a ground sill in the case of drift timbering. The longer pieces of such a frame, or rectangular crib, as they usually cover, or are placed against, the hanging and lying walls of the lode, we shall designate, as we have hitherto done, wall pieces, or longer pieces; the shorter pieces, as they usually cover the short sides of the shaft, we shall call side pieces.

These coils, or frames, generally form the commencement and end of a particular set or combination of timbers, the repetition of which forms the complete lining of the shaft. These frames, then, have not only to resist the pressure of the ground, but also to serve as a support to the adjoining timbers forming the set, and hence must be firmly and solidly secured into the ground, with which, or from which, the intermediate timbers require no support. In certain cases several of the cribs, or frames, may form part of the ordinary timbering, and consequently not be expected to carry the weight from the ground. Those frames which are fixed firmly into the ground for the purpose of carrying the weight of the rest of the lining are called bearing, or carrying, frame cribs, to distinguish them from the ordinary cribs, which are simply called frames, or cribs.

The first of these bearing cribs, which is laid on the surface of the ground, and from which those below are to some extent supported, is called the day crib. For rectangular shafts this consists of a rectangular frame, the two longer sides of which we shall designate as wall pieces, for reasons above given, and occasionally as the longer pieces or longer sides of the frame. The shorter pieces we shall, as before, designate as side pieces. The wall pieces of the day crib usually extend some considerable distance beyond the side pieces, and likewise the side pieces extend the same distance beyond the wall pieces (i.e., the wall pieces and the side pieces and wall pieces cross each other at the corners). That portion of the ends of the side and wall pieces which thus extend beyond the outside of the frame is called in some districts the tail, and varies from 12 to 30 in. in length, and in loose ground this may be still more. The length and breadth of the frame are made slightly less than the length and breadth of shaft; the frame rests on the surface of the ground by the projecting ends; the surface of the ground is dressed previously to receive the frame, which should rest perfectly horizontally on the ground. The side pieces are usually connected to the wall pieces by means of a scarfing to about one-third the depth of the frame. In other cases the side pieces (sometimes called bolts) are dovetailed into the wall plates, and lie in the same plane, the upper and lower surfaces of the side pieces being flush with the upper and lower sides of the wall pieces. In this case of course it is only the wall pieces which extend beyond the area of the shaft, and by which the frame is supported. In quick or swimming ground with this arrangement it is necessary to have long wall pieces, in order to secure the necessary area for the support of the frame. According to the number of divisions required in the shaft the day crib receives one or more cross bearers, which are attached to the wall pieces in the same manner as the side pieces only that they do not usually project beyond the wall pieces like the latter. Where the shaft is of considerable length it may be necessary, if made from oak timber, to make the wall piece from two shorter pieces, which are joined together by a horizontal scarf joint made secure by iron plates and bolts; a cross piece, however, is then usually placed across the shaft between the two longer pieces, where the joint is situated.

Vertically beneath the day crib are placed the ordinary bearing cribs at distances varying (according to the nature of the ground, and the kind of timbering used) from 1 yard to 2 yards apart. The bearing cribs may be fixed in the shaft in various ways, which will depend to a great extent on the character of the ground to be passed through. If the hanging and lying walls are good the side pieces will be notched into the hanging and lying walls, and the wall pieces will be simply laid upon these, and connected by any of the joints we have described. As, in general, the bearing cribs are laid horizontally in vertical shafts, the distinction between the hanging and lying walls will then vanish, and the stempel notch—or Bühnloch and the Anfall—are made to alternate first on one side and then on the other. Where the hanging and lying walls are loose, and the short sides solid and compact, the wall pieces will project into the short sides, and the stempel notch and Anfall made to alternate as before, the shorter sides of the frame being then supported or carried from the wall pieces.

PUMPING MACHINERY—No. II.

After Watt, to three celebrated Cornishmen is mainly due the honour of achieving this great success—Hornblower, Woolf, and Trevithick. Hornblower invented the double cylinder or compound engine, and erected one at Tincroft Mine in 1790, cylinders 21 in. and 27 in. diameter, the lantern brass, the double-beat valve, and the surface condenser. Woolf greatly improved the compound engine, used high-pressure steam, and obtained by expansive working an excellent result; and it is the adoption of Woolf's and Hornblower's inventions and improvements in the present day that enables our mercantile marine to become carriers of a very large portion of the merchandise of the world; and it is not an exaggeration to say that had Woolf's plans been adopted in the Royal Navy and the mercantile marine 30 years earlier millions of pounds sterling would have been saved in fuel, to say nothing of the amount that would have been saved in machinery; and yet the names of these great pioneers are being dropped out of sight. Both Woolf and Trevithick were practically well acquainted with the advantages attending the use of high-pressure steam, and for its generation Woolf schemed various kinds of boilers, including those with small tubes, in which the water circulated through them, the fire being applied outside. Trevithick's invention of what is now called the Cornish boiler provided engineers with a safe and economical plan for generating high-pressure steam, and these boilers continue to be almost universally employed, either with one or more tubes. Trevithick was the pioneer in the use of high-pressure non-condensing engines for pumping, locomotive, and a host of other purposes, but for our deep Cornish mines he adopted single cylinder condensing engines to work exclusively with high-pressure steam, and this type of engine remains in use at present, to the exclusion of almost all others, in Cornwall. There was for many years great rivalry between the advocates of the combined and single cylinder engines. In 1824 Woolf erected at Great Wheal Alfred two pumping-engines—one on the combined principle, with cylinders 70 in. and 40 in. diameter respectively, and a 90-in. cylinder single-acting engine. On first setting these engines to work, and as long as the load continued light, the combined engine had rather the advantage, but with increased load the single engine was proved to be the more economical in fuel, and otherwise preferable, so that Woolf himself decided after this competitive trial in favour of the single engine. Subsequently Sims invented a new form of combined engine; he placed the cylinders one over the other. The question as to the relative merits of the two classes of engines was again warmly discussed, but after various trials the single cylinder engine still retained its supremacy. Theoretically there is no difference in the economy of the two types

of engines, provided the steam is equally expanded in both. Practically, however, owing to losses in steam ways, clearances, loss of heat by radiation, friction, &c., the single cylinder engine is more economical than the compound engine. There is, however, an important difference in the action of the two engines. There is less difference between the initial pressure of steam and the pressure at the termination of the stroke with the condensed engine, and, therefore, less strain on the machinery and pitwork when working at the same rate of expansion, and this fact mainly induced Woolf and Sims to persevere in their use. It has been stated that, according to Lean's registered reports, the duty of pumping-engines was gradually improved up to the year 1844, when it attained the maximum—an average duty of 38,000,000 for 37 engines reported, or a consumption of about 3½ lbs. of coal for each effective horse power per hour. From Lean's report of March last I find there are only 14 pumping engines reported, and that the average duty has fallen to 49,000,000, or about 4½ lbs. of coal per effective horse power per hour, being an increase of nearly 40 per cent. in the consumption of fuel for a given amount of work done; this is a serious decline, and merits investigation. And the first step in the investigation should be, in my opinion, to determine as to how far we are working on the same system as the men of the last generation, and where we differ from it. No doubt pumping-engines are working under more disadvantageous circumstances in Cornwall than formerly, owing to the increased depths of mines requiring additional weight of rods, &c., in the shaft. Moreover, the proportion of diagonal to perpendicular shafts has increased of late years, and this involves increased friction underground. But after making due allowance for these unavoidable causes, the decline in duty is not nearly accounted for. There remains, therefore, the question as to the quality of coal supplied to the mines, and on this head we have not all the required data for comparison. We have, however, thanks to Messrs. Lean, the important fact on record that in the last six months of the year 1838, according to the experiments of the late Mr. Loam, the quantity of coals consumed by Loam's engine in the United Mines (diameter of cylinder, 85 in.) was 700 tons; and the quantity of feed pumped into the boilers, which was accurately measured, was 14,638,125 lbs. The evaporation was, therefore, equal to 1835 lbs. of water per pound of coals, the temperature of the feed being on an average 102°; here, therefore, we have the means of knowing the pressure in the boilers, comparing the coals used at the present day with those consumed when engines were doing a very high duty. We are, however, ignorant as to the quality of the above-named coal. The evaporative power was high, and appears to have been equal to the best Welsh coal of the present day. Taylor's engine, also on the United Mines, 85-in. cylinder, did a duty of 101,000,000, with the consumption of 94 lbs. of coal, from July 1 to Aug. 4, 1841, but the load was light and the rate of expansion high. As an example of what may be accomplished at the present day with the use of common coals, I may state that there is working on the Mellanear Mine a very old 76-in. cylinder single-acting pumping-engine. The vacuum is not good, the air pump being, I think, too small; the cylinder is not steam jacketed, nor are the steam pipes all clothed, the piston packed, drawing 80 fms. perpendicularly, and the remainder diagonally, pole at bottom, but common mining coal is burnt. This engine is reported by Mr. Lean for March last as doing a duty of 604 millions, showing, therefore, that the coal cannot be so seriously in fault as many suppose, and that the causes for the decline in duty must be sought elsewhere. Roughly, a pumping engine, to work economically, should run 3½ expansively, with a boiler pressure of at least 60 lbs. per square inch; burn for 26 hours about 20 cwt. of coal to each boiler of 10 tons weight, of usual construction and proportion of fire-grate. Then, if the pitwork is in good order, and the rods properly balanced, the engine, if well constructed, will do good duty, will be working within the limits of practical safety, and compare favourably with the engines of former times. In order to test where the fault lies in case a good result is not obtained in pumping, it is necessary to measure the quantity of water evaporated by the coal used; also to ascertain the indicated horse power and determine the effective horse power by calculating the quantity of water and the depth from which it is pumped. We can then determine whether the fault rests with the boiler and coal, the engine, or the pitwork. From an examination of several indicator diagrams of pumping-engines, I have come to the conclusion that the difference between the indicated horse power and the effective varies from 25 to 50 per cent. Therefore, for the sake of comparing the duty performed by different engines, the indicated as well as the effective horse power should be reported. When comparing the duty performed by pumping-engines and those employed for marine or other purposes, it must be borne in mind that the first is effective and the latter indicated horse power. Thus corrected for friction, the consumption of coal per indicated horse power per hour, when in 1844 the average duty was 68,000,000, did not probably exceed 2½ lbs., a result not surpassed by the average working of the best compound engines of the present day consuming best steam coals.

The limits of my paper will not allow me further to discuss pumping machinery. I have in the main confined my observations to that which principally concerns mining men. I would, however, add that I think under some circumstances another arrangement of the single-acting engine would be advisable. Drawing No. 3 is a plan of an engine designed for pumping, by which the cost of building would be much reduced. There is nothing new in the plan beyond the adoption of two piston rods, which arrangement diminishes the strain on the cross heads, and would add great steadiness to the working of the engine. It seems rather absurd to discuss plans by which the duty of bygone days may be exceeded until we have recovered the lost ground, yet there is no doubt but that a better duty might be obtained now than at any former period. We can build better engines than formerly, insuring greater accuracy in boring cylinder, and less friction in working of the engines. Boilers can also be constructed to work at a much higher pressure with safety and economy. The direction in which we are to seek for greater economy of fuel is also well understood, and that is to work at a higher pressure. For marine purposes boilers 10 to 12 ft. diameter are constructed for a working pressure of 60 to 80 lbs. per square inch. The higher the pressure of steam employed, other things being equal and within practical limits, the greater will be the economy of fuel. It would seem also very desirable to employ surface condensers for mine engines; by their use a better vacuum would be obtained, and clean water would always be fed into the boilers, so that they would rarely require cleansing. Considering, too, that there would be little waste of water, it would be very easy and inexpensive to determine the quality of the coals by the amount of water evaporated. All these remarks apply, of course, to rotary as well as pumping-engines. The mechanical equivalent of the heat evolved by the combustion of coal being so largely in excess of the best results obtained by our steam-engines, it has been supposed by some that their duty may be enormously increased, so as to approach this theoretical perfection. A moment's consideration of the process of combustion will correct this view. It is widely understood that the combustion of coal in our furnaces requires the oxygen of the air to combine with the carbon, but oxygen cannot for that purpose be separated from the nitrogen with which it is associated; and since four parts of nitrogen are mixed with one part of oxygen in common air, it is clear that the nitrogen must be heated to the temperature of the furnace, and although in passing through the flues it parts with much of its heat, yet it finally escapes through the chimney, carrying away from 300 to 500° of heat, which is lost; this is one reason out of many why the theoretical perfection cannot be approached. The combustion of coal in our furnaces is simply the violent collision of the atoms composing the gases; their movement is conveyed to the boiler, which in turn conveys it to the water within it, the particles of which are repelled from each other, and steam is formed, which, in parting with its heat in the cylinder of a steam-engine, gives us the mechanical equivalent, which we can employ for our special purposes. It is established that 772 lbs. of work must be consumed to produce a unit of heat, and that conversely when applied to produce mechanical effect, a unit of heat must be destroyed to lift 1 lb. 772 ft. high, the unit of heat having been determined by Joule as the quantity required to raise 1 lb. of water 1° Fahr. Knowing, therefore, the temperature and weight of the steam admitted into the cylinder, and the temperature at

* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergsrath Dr. von Gneiss, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

which it enters the condenser, we can calculate the utmost mechanical effect attainable in a steam-engine, and ascertaining the work performed by the engine can determine in how far it falls short of the greatest attainable duty. That engine will give the best results, other things being equal, where there is the greatest difference between the steam entering and leaving the cylinder. We know pretty well the disease afflicting our engines. The question is—can it be cured at a reasonable cost? The writer has calculated that the probable cost of coal supplied to the 14 pumping-engines, reported by Mr. Lean for March last, was in round numbers 1000*l*. Provided we were doing the duty of 1844, this cost would not have exceeded 600*l*, or for the year 4800*l*. saved; this amount per annum would do six or seven years pay for the entire renewal of the 14 engines and boilers reported. From the causes enumerated in this paper we cannot probably rival the duty of 1844, but we can and ought to reduce the consumption of coal.

[To be continued.]

GEOLOGICAL SOCIETY OF LONDON.

June 19.—JOHN EVANS, D.C.L., F.R.S. (Vice-President), in the chair.

Chas. Louis Buxton, Bolwick Hall, Marsham, Norwich; Wybrandts G. Olpherts, Chief Engineer's Office, East India Railway, Calcutta; and Wm. Phelps Richards, the Poplars, Shepherd's Bush, were elected Fellows of the Society.—Rev. Jas. Compton, Buckley, *via* Chester; and John Dennis Paul, Leicester, were proposed as Fellows of the Society.—Arthur Goodger, Albert Academy, Burghersdorp, Cape Colony; Rev. Walter Howchin, Haltwhistle, Northumberland; Lieut.-Col. A. McMahon, Hissar, Punjab; Oswald Milton Prouse, C.E., Westbourne House, Shaftesbury-road, Hammersmith; and M. G. Stuart, B.A., St. John's College, Cambridge, will be balloted for as Fellows of the Society.

The following communications were read:—
1. "On the Section of Messrs. Meux and Co.'s Artesian Well in the Tottenham Court-road, with notices of the Well at Crossness, and of another at Shoreham, Kent; and on the probable range of the Lower Greensand and Palaeozoic Rocks under London," by Prof. J. Prestwich, M.A., F.R.S., F.G.S., V.P.G.S.

The well-known boring at Kentish Town in 1856 showed the absence at that point of Lower Greensand, the Gault being immediately succeeded by hard red and variegated sandstones and clays, the age of which was at first doubtful, but which was finally considered by the author to approach most nearly to the Old Red Sandstone near Frome, and to the Devonian sandstones and marls near Mons, in Belgium. The existence of some doubt as to this identification rendered the boring lately made at Messrs. Meux's Brewery particularly interesting, and the method of working adopted by the Diamond Boring Company, by bringing up sharply cut cores from known depths, gave special certainty to the results obtained. The boring passed through 652*ft*. of chalk, 28*ft*. of Upper Greensand, and 160*ft*. of Gault, at the base of which was a seam, 3 or 4*ft*. thick, of phosphatic nodules and quartzite pebbles. Beneath this was a sandy calcareous stratum of a high ash colour, passing into a pale or white limestone, and this into a rock of oolitic aspect. Casts and impressions of shells found in this bed showed it to be the Lower Greensand, whose place it occupied. The boring was carried further in the hope of reaching the loose water-bearing sands of this formation; but the rock became very argillaceous, and when 62*ft*. of it had been passed through the boring entered into mottled red, purple, and greenish shales, dipping at 35° in an unascertained direction. These beds continued through a depth of 80*ft*., when, their nature being clearly ascertained, the boring was stopped. The fossils of these coloured beds, which included *Spirifera disjuncta*, *Rhynchonella cuboides*, and species of *Edmondia*, *Chonetes*, and *Orthis* show them to be of Devonian age. Thus, the existence of Palaeozoic rocks at an accessible depth under London, and the absence of the Jurassic series, as maintained long since by Mr. Godwin-Austen, is experimentally demonstrated.

These facts are of interest in connection with the question of the possible extension of the Coal Measures under the Cretaceous and Tertiary strata of the south-east of England. The beds found at the bottom of Messrs. Meux's boring are of the same character as the Devonian strata, which everywhere accompany the Coal Measures in Belgium and north of France, being brought into juxtaposition with them by great faults and flexures. The author refers especially to a remarkable section at Auchy-au-Bois, in the western extremity of the Valenciennes coal field, which is particularly interesting from its furnishing evidence that the Hardinghen coal field, between Calais and Boulogne, is a prolongation of that of Valenciennes, and because the same strike and a prolongation of the same great fault observed at Auchy-au-Bois through Hardinghen would carry the southern boundary of any coal field in the south-east of England just south of Maidstone, thence passing a little north of London. Hence it is in the district north of London that there is most probability of the discovery of the Carboniferous strata. The extent of country in which shafts could be sunk to the Palaeozoic strata will, however, be limited by the presence of the water-bearing Lower Greensand, which probably reaches close to London in the south, reappears in Buckinghamshire and Bedfordshire, 30 or 40 miles north of London, and probably extends some distance towards the city under the Chalk hills of those counties and Hertfordshire.

The nature of the representative of the Lower Greensand in the boring, and the characters of the fossils contained in it, lead the author to the conclusion that in it we have a deposit produced near the shore of the Neocomian sea, here probably consisting of cliffs of Devonian (or Carboniferous) rock. From these cliffs the calcareous material which here replaces the usual loose sands of the Lower Greensand was perhaps derived by the agency of springs; and the shore-line itself must be situated between the south end of Tottenham-court-road and the Kentish Town boring. The sandy beds of the Lower Greensand will probably be found to set in at no great distance to the southward, presenting the conditions necessary for storing and transmitting underground waters. A test boring made by Mr. H. Bingham Mildmay, at Shoreham-place, about five miles from Sevenoaks, and in which the Lower Greensand was met with at about the estimated depth (450*ft*) and furnished a supply of water, seems to confirm these views.

2. "Notes on the Palaeontology and some of the Physical Conditions of the Meux's well Deposits," by Charles Moore, F.G.S.

During the discussion on this paper, Prof. RAMSAY said that as the South Wales coal field, the Bristol coal field, and the Forest of Dean coal field were basins originally continuous, and only separated by denudation, Mr. Prestwich and himself had agreed before the Royal Coal Commission that coal fields might exist below the Secondary strata to the eastward. The correctness of this opinion was proved by the boring put down by Mr. Fox, at Burford, in Oxfordshire, which reached undoubted Coal Measures. Prof. Ramsay thought that one of these coal fields might yet be found near London by penetrating the overlying Secondary rocks.

3. "On *Pelacichnus*, a new genus of Sea-urchin from the Coral Rag," by W. Keppel, B.A., F.G.S., Professor of Geology in the University College of Wales.

4. "Remarks on *Saurocephalus*, and on the species which have been referred to that genus," by E. Tulley Newton, F.G.S., of H. M. Geological Survey.

5. "A microscopical study of some Huronian Clay-Slates," by Dr. Arthur Wichmann.

6. "On a Section through Glazebrook Moss, Lancashire," by T. Mellard Reade, F.G.S.

7. "On the Tertiary deposits on the Solimoes and Javary Rivers in Brazil," by C. B. Brown, with an Appendix by R. Etheridge, F.R.S., F.G.S., and communicated by him.

8. "On the Physical History of the English Lake-district, with notes on the possible subdivision of the Skiddaw Slates," by J. Clifton Ward, Assoc. R.S.M., F.G.S.

9. "On some well-defined life-zones in the lower part of the Silurian (Sedg.) of the Lake-district," by J. E. Marr; communicated by Prof. T. M. Hughes, M.A., F.G.S.

10. "On the upper part of the Bala Beds and Base of Silurian

in North Wales," by F. Ruddy; communicated by Prof. T. M. K. Hughes, M.A., F.G.S.

The next meeting of the Society will be held on Wednesday, Nov. 6.

EXPLOSION OF FIRE-DAMP IN MINES.

At the Manchester Geological Society's monthly meeting, held in Manchester on Tuesday, Mr. JOSEPH DICKINSON, Her Majesty's Chief Inspector of Mines in the chair, and which was numerously attended by the leading mining engineers of the district, an interesting discussion took place on the subject of the Explosion of Fire-Damp in Mines.

THE FIRING OF SHOTS IN MINES.

The CHAIRMAN said the members would recollect that at the last meeting of the society a paper by Mr. Sutherland on the different methods of firing shots was read, and a quotation, attributed to Major Forbes, of the Home Office, was given from the Mining World, condemning the use of "snuffs." Major Forbes had since written to him (the Chairman) saying that he had not seen the article in the Mining World, and that the opinion expressed as to the use of "snuffs" was that of the writer, not his. It would be seen in the report to which it referred that he merely described the method so as to explain what was in his opinion the cause of the accident. He did not express any opinion as to how this might be improved upon. This, the Chairman said, was satisfactory, inasmuch as it showed that the opinion generally expressed at the meeting of the society was concurred in by Major Forbes, that the mode of firing shots in mines was not disapproved of by any authority.

EXPLOSIONS OF FIRE-DAMP.

MR. GEORGE WILD (colliery manager, Bardsley, Ashton-under-Lyne) then read a paper on "Explosions of Fire-Damp, and whether they can be avoided, or their severity mitigated." He said the object of the paper was to put forth a few plain and practical suggestions, in the hope that a discussion such as that society was capable of might elicit the best means of avoiding, or at least mitigating, the sacrifice of life from explosions of fire-damp. The most serious, and at the same time most unavoidable, accident in connection with mining under the present efficient system of inspection, management, and colliery appliances which were most to be feared were those arising from the sudden and unexpected appearance of explosive gas in such quantities as to foul the otherwise well ventilated workings, rendering a well-conditioned Davy lamp unsafe even in the hands of a skilful man. These influences of gas arose in several ways, which were more or less unavoidable. Depression of the barometer, though not sudden, might, from a lessened pressure on the pores or fissures from which the gas exuded, or from extensive goaf cavities, allow sufficient expansion of the volume so as to foul the ventilation. Yet cases had been met with where a slackened ventilation would often neutralise that effect for a time proportionate to the extent of goaf cavity ventilated. Another dangerous, and to some extent unavoidable, cause was a sudden settling down of the roof or upheaval of the floor in the goaves when working homewards—undoubtedly often the cause of serious explosions, by forcing out the gas upon a naked light, or, if they would allow the paradox, an unsafe safety-lamp. The most to be dreaded, and so far the most unavoidable cause, was the outburst proper, the avoidance of which, so far as practicable, was one of the objects of the paper. Thirty or forty years ago cases were rare in this part of the country, though very fiery mines were then being worked, in which more than three persons were injured by the same explosion, and the thought of danger to anyone not in the immediate vicinity of the accident was as rarely entertained. Now, however, we had less fiery mines, worked with a sweeping ventilation which at one time would have been thought sufficient for four such collieries, yet explosions occurred terribly destructive to life and property. What was an adequate amount of ventilation for one colliery might not be one sixth of what would be essential to the proper ventilation of another employing the same number of hands; but to cope with emergencies such as the sudden influx of gas, ventilation the most powerful was not a certain remedy. He would suggest the exclusive use of the best safety-lamp wherever gas was known to exist in a dangerous quantity. He regretted that some scientific gentlemen had expressed themselves in such a manner as to lead the public to believe that the exclusive use of the safety-lamp meant a substitute for good ventilation and proper attention to meteorological phenomena. He was inclined to believe, however, that atmospheric changes had but a small share in bringing about most of these direful calamities, and that the strictest attention to the construction of the lamp, its proper trimming, and careful use was of far greater service in averting an explosion than would be the labours of an expert meteorologist at every colliery, with telegraphic or telephonic communication with every part of the mine ready to give warning of all atmospheric disturbances. That we possessed a safety-lamp only in name, and that it never was considered safe by the inventors, was well known; that the experiments carefully made in different parts of the country conclusively proved that the Davy lamp under circumstances frequently met with in fiery and well ventilated mines was extremely unsafe they must all admit; and that even the Stephenson type, which he had reason to consider much the best in use, was far from being absolutely safe under all circumstances was proved by the experiments conducted under the auspices of the North of England Institute of Mining Engineers. Where it was practicable to adopt the long-wall principle it would be found, contrary to the opinion of many persons, that the liability to danger from sudden falls of roof forcing gas from extensive reservoirs left behind was almost *nil* compared with that of working homewards. Though the improved standard of education was beginning to be perceptible in the working miner, the attentive official, the skilful manager, and the accomplished mining engineer, it was to be feared we scarcely kept pace in our underground arrangements with the modern appliances appertaining to coal mining, which were bringing within reach deep fiery mines at one time thought inaccessible, opening up mines at one time thought unworkable from their fiery character, raising a quantity of coal from one pair of shafts that necessitated the employment of hundreds in place of scores. He thought it possible to separate districts in such a manner that an explosion happening in one part of a mine might not so destructively affect another portion. To accomplish this he suggested that all crossings separating districts or main currents should be constructed so as to withstand the effects of the most severe explosion. This might be done by adopting wrought iron tubular crossings made of plates, the thickness of which might be proportionate to their diameter. It was generally found that the present form of wooden air-doors succumbed to a severe explosion, and instead of the ventilation partially recommencing, the air took the shortest route, and if the winding apparatus were disarranged the first half hour after the explosion—the most valuable time—was lost, and the men who ran towards the downcast shaft by the intake were struck down, often when they had gone a considerable distance in the direction of succour. This might be obviated by supplementing each air-door by a specially made air-sheet strong enough to hold its own under the most severe hurricane or blast experienced. A stop valve for the temporary separation of the districts was worthy of serious consideration as to whether it would not merit the appellation of a safety-valve. What was proposed was that each district should have its return air ways contracted into one of due proportion previous to joining with the other districts in the vicinity of the dumb-drift, and that in the single road should be placed a very strong valve, fixed in such a manner that it would come into play and for the moment effectually resist the force of the blast, and in a great measure the flame from all the other districts.

After the reading of the paper a number of questions were asked with regard to the construction of the air-doors proposed by Mr. Wild, and a general opinion was expressed that it would be impossible to construct them strong enough to resist the force of a great explosion, one member observing that he had seen iron rails torn up from the roads and twisted like wire.

MR. G. C. GREENWELL said the important question as to whether these doors could or could not be constructed strong enough could no doubt be decided after further consideration had been given to

the matter, but there was another question of great importance with regard to ventilation which had been suggested in the paper. He understood Mr. Wild to say that with a depression of the barometer, and an increase in the ventilation, there was a liability to draw gas out of a goaf, which would make the mine dangerous, and that under these circumstances he recommended a decrease of the ventilation.

MR. WILLIAM BRYHAM (Rose Bridge Colliery, Wigan) said he had never known gas brought out in such quantity by increased ventilation as to make the return air-ways unsafe if they were not safe before. It would be a dangerous thing to go forth to say they must work with less because the barometer had fallen.

MR. JOHN HIGSON (Manchester) suggested that a goaf must have been in a very dangerous state if increased ventilation brought out sufficient gas to make the return air-way unsafe. Theoretically speaking the air ought to be much better by the increased ventilation.

MR. WILD could not say that goafs as a rule were safe. He had made examinations both before and after increased ventilation, and the air which before was pure he had found afterwards to be foul.

MR. BRYHAM asked whether Mr. Wild wished it to be understood that in the event of a fall in the barometer, and with a goaf full of gas, that the air should be slackened rather than increased?

MR. WILD: Unless increased care goes along with it. Proper precaution should be taken if the ventilation were increased. What he objected to was the sudden increase of the ventilation without due care as to its effect.

MR. MARTIN (Assistant Inspector of Mines) understood Mr. Wild's meaning to be that if a furnaceman, noticing a falling in the barometer, suddenly increased the ventilation it might be dangerous.

MR. WILD said that if they began tearing the gas out quickly into the return air-ways it would be dangerous.

MR. BRYHAM said he should not like to tell his underlookers to slacken their currents of air when there was a fall in the barometer. He thought it would be very dangerous.

MR. HIGSON, referring to the proposed air-doors, said his experience went entirely opposite to the theory laid down by Mr. Wild. In the first place, he did not think these doors could be constructed strong enough to resist any serious explosion; and, in the second place, in the case of a small explosion they would be liable to cause a new danger, inasmuch as they might cause it to be destructive, when otherwise it would have done little harm had it not been confined in a small space.

A discussion next took place with regard to the relative number of lives lost in the present and olden times.

MR. BRYHAM said he remembered an explosion about 40 years ago in his district, when 38 men, the whole number in the pit, were killed, and another where 16 were killed.

MR. WILD observed that the numbers killed in each explosion were considerably less formerly than now.

MR. HIGSON observed that the pits were now more full of men, and it was not impossible that the force of an explosion when it did occur was increased by the more powerful ventilation and the increased strength of the appliances they had now in the mines.

MR. WILD said the great currents of air now passed into the pits were able to distribute the gas through a mine with very little warning. He strongly objected to the use of naked lights in fiery seams, and he also considered shot lighting to be a very dangerous practice in fiery mines.

MR. HIGSON observed that a gentleman had said to him that, notwithstanding the explosions in the Wigan district, they had not profited one iota in improving their method of working.

MR. BRYHAM said the suggestion of laying out a mine on the long-wall system, and dividing it into sections was, he thought, a good one. It might be the means of lessening the effect of the disasters when they did occur, although it could not do away with them altogether.

MR. GREENWELL said that now when they were putting 500 men into a colliery were formerly only 50 or 100 were employed, it was only natural that the explosion should be more disastrous to life than formerly.

MR. MARTIN said the question was whether the laying out of mines in panels, as suggested by Mr. Wild, might not confine the explosions to a small area.

MR. GREENWELL referred to an explosion at a pit divided in this manner, and where every man was killed.

MR. HIGSON also referred to another case of a similar nature.

The CHAIRMAN said the laying out of a mine was a very important matter. They could not go down many mines without noticing the vast difference in them in this respect. Some were laid out on what might be called a villainously bad system, whilst others could not be improved. The liability to explosions of gas might be avoided to some extent by the laying out of the mine.

MR. HIGSON did not think the quantity of air passing through a mine, nor yet the system of cutting, had anything to do with the explosions. He quite admitted that there were good and bad systems of cutting, but the explosions in Lancashire and Yorkshire had not borne upon the method of cutting out coal.

The CHAIRMAN said the subject which had been under discussion was a most important one, and Mr. Wild, who had brought the matter forward, was a mine manager of great experience, whom he had known personally for a quarter of a century. He knew that Mr. Wild had had to deal with very fiery mines, and any observations which came from him were deserving of attention, for he had no doubt they were the result of quiet and long-continued observation. Apparently he had not had to do with explosions where there had been a great amount of force exerted, as he seemed to doubt that the force of an explosion was sufficient to strike a man dead on the spot without his being blown against something, but he (the Chairman) could not think there was any reason to doubt that death was so produced in many explosions. He had over and over again seen men struck dead by the mere pressure of the blast, and at the explosion at the Unity Brook Pit, Kirsley Moor, there was scarcely a man who had run a yard, and in the more recent explosion at Haydock there were many such deaths. Some were blown to pieces, but there were others who were killed simply by the great pressure. Mr. Wild's experience dated from the time when some of the most fiery mines known were worked. These mines were ventilated with less quantities of air than now, and when an explosion did take place there was not sufficient air to take it to the extreme parts of the mine, but if they went on increasing the quantity of air they would no doubt increase the health of the men working in the mines, and that would be a great gain. Something had been said about the great loss of life in recent colliery explosions, but the lives lost now were nothing like what they were in olden times. During the last twenty-five years a steady diminution had been going on in the number of colliery accidents, and in nothing was it more marked than in the number of explosions. The number of lives lost in proportion to the number of men employed had greatly decreased, both per accident and persons employed. Whilst this improvement had been going on there had been an increase under some heads, such as under trams and tubs, but this was easily accounted for, as 30 years ago there was scarcely such a thing as a tram or a tub known or employed in a colliery. Accidents happening to men in shafts had greatly decreased, notwithstanding the great rate at which they ran through them, as much as 40 miles an hour. But notwithstanding the great depth of the shafts, and the great velocity with which the cages were raised and lowered, the number of accidents in proportion to the number of men employed had fallen off amazingly. Owing to the legislation that had taken place, and the keen eye which the public kept upon all mining matters, he thought that, except in the matter of laying out mines, attention to the safety of colliers had now been brought almost to the extreme point—in deed, to carry it much further would almost make the lives of the workers in mines miserable. But the laying out of the mines was the most important point of all, and a gentleman who had taken a prominent part in the discussion that day had said that, notwithstanding all the explosions which had taken place in the Wigan district, there had not been any warning taken to introduce a better system, and the Wigan 9-ft. was still worked on the same system as before. The main point was to lay the mines out on the best system. They might use safety-lamps, avoid powder if they were going to get more large coal; but with all their precautions

THE SUPPLEMENTARY SHEET.—We have received occasional complaints, and of late a good many, that the Journals delivered by country booksellers without the Supplement, and Subscribers who oblige us by demanding the paper, should be handed to them complete, as every Journal is accompanied by the Supplement when it leaves our office, and the fault of omission must rest with the country bookseller or their London agent.

respective produce will be given next week. Drawing and dressing are being pushed on as fast as possible with a limited supply of water. The parcel of ore pushed on last Tuesday realized 2385. 184, or 92. 11a. per ton.

PRINCE OF WALES.—J. Andrews, June 26: There is no change in the deep adit and driving of Vigar's shaft, the lode in which is still small and poor.

ROMAN GRASS.—A. Waters, June 27: The 110 fm. level, to drive south of the new engine-shaft, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 south, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 north, by six men, at 132. per fathom; lode worth 1 ton per fathom.

The 110 west, by six men, at 132. per fathom; lode worth 1 ton per fathom. The 110 east, by six men, at 132. per fathom; lode worth 1 ton per fathom.

fathom, producing tin. To stop the back of the 60 west, by four men, at 32. 10a. per fathom; the lode is 3 ft. 6 in. wide, worth 7. per fathom, producing tin. To sink a winze in the bottom of the 60 east, by six men, at 52. per fathom; the lode is 4 ft. wide, worth 5. per fathom, producing tin. To stop the bottom of the 60 east, by six men, at 42. per fathom; the lode is 10 ft. wide, worth 15. per fathom, producing tin. As soon as the winze is holed to the 70 fm. level we shall have some of the sides of this stop blasted down, as there is tin going off in the sides. We have commenced to carry our copper ore to Hayle against the next sampling.

WEST TANKERVILLE.—Arthur Waters, June 27: The 86, south of shaft, is in a lode 14 ft. wide, worth 3. per fathom. The stop in the back of this level south is worth 1 ton per fathom. The stop in the back of the 75 south is worth 12 cwt. per fathom. The stop in the back of this level, on the west portion of the lode, is worth 1 1/2 ton per fathom. We are stripping down the lode here below the said stop, the yield being worth 3/4 ton per fathom. The drift going south on the said part of the lode is worth 2 tons per fathom. We have to-day sold 30 tons of blende for 65/., and sample 30 tons of lead ore for sale next week.

WEST WHEEL TOLGUS.—June 28: The 145 and is being driven west on the north part of the lode, by eight men, at 82. per fathom. This end is nearly under No. 2 winze; we intend drawing 6 or 8 ft. more, then put up a rise to communicate with the winze. We shall then have good ventilation for everything in this level; end yielding 4 tons of ore per fathom. We have also a pair of men driving west from the cross-cut, on the south part of the lode, at 62. 10a. per fm., moderate ground, which we estimate to be worth 2 1/2 tons of ore per fathom, thus making 6 1/2 tons per fathom. Between the north and south end there is a horse standing 5 ft. wide or thick. By leaving the horse standing we shall have firm ground to rest the stall timber on, thereby saving cost of timber, and labour of putting it in. We have also two stopes, one east and the other west of No. 1 winze, with six men in each, at 22. 15a. and 22. 10a. per fathom. These are stopping on the north part of the lode, each yielding 4 tons of ore per fathom. We calculate on having some good ground on the south part of the lode also, but we must take away a part of the north ground for it. We shall have some help from the south part after a little while. The shaftmen at Taylor's have nearly completed all the work required preparatory to commencing with the sinking again, and the boring machinery is finished, with the exception of fixing the boring apparatus in the bottom of the shaft, which is now to be done forthwith.

WHEEL CREBOR.—J. Andrews, June 25: In the 120 east we are driving by the side of the lode. The lode in No. 1 stop, in back of the 130, is worth 32. per fathom. The lode in No. 2 stop, in back of the same level, is worth 15/., per fm. All other points are the same as reported last week.

WHEEL GREENVILLE.—T. Hodge, June 26: At Gould's shaft, sinking below the 150 fm. level, the Old Lode is dipping south rapidly. We shall continue the sinking in line with the shaft upwards, consequently we shall intersect the flat lode before we reach the junction. The shaft is going down with fair speed. The lode is worth 82. per fathom. The lode in the 140 west end is improving as we extend.—Western Shaft: We have done but very little in the 160 east end during the past week. The lode in the 150 east end is showing a better appearance, yielding stamping work. The 140 east end is worth 7. per fathom. The 130 west end is not quite so productive, but from the appearance of the lode to-day I think it will improve again shortly. No other change in the bargains. All surface work is being pushed on with utmost dispatch.

WHEEL KITY (St. Agnes).—S. Davey, R. Harris, June 22: New Shaft—Pryor's Lode: In the 184 we are driving south, in which direction the lode is thrown, and hope to reach it in course of another week. The lode in the 142, driving east of shaft, is 72. per fathom; the lode in the 142, driving west of shaft, is 5 ft. wide, and worth for tin 14/., per fathom. The lode in the rise in the back of the 142, west of shaft, is 3 ft. wide, and worth for tin 10/., per fm. The lode in the 106, driving west of shaft, is 2 ft. wide, and worth for tin 4/., per fathom. The lode in the 94, driving west of shaft, is 2 1/2 ft. wide, and worth for tin 8/., per fathom. The lode in the 65, driving west of shaft, is 3 ft. wide, and worth for tin 7/., per fathom.—Old Lode: In the 100, driving west of engine-shaft, the lode is not yet out of the influence of the gossan. The lode in the 90, of engine-shaft, is unproductive.

WHEEL NEWTON.—H. Bennett, June 27: The lode in the 50 end, east of 90, is about 2 ft. wide, presenting a very kindly appearance. The 50 end west is of much the same character. In the 40 end east the lode is 18 in. wide, composed of flooken, carbonate of iron, sulphur munda, and a little silver. In the adit end west of engine-shaft the lode is 2 ft. wide; a very promising lode, with a little silver. We are erecting a horse-whim at Bennett's shaft, on the old silver lode; the lode in the shaft is of a very kindly appearance, containing spots of silver.

WHEEL PEVOR.—W. T. White, J. Pryor, June 27: All the bargains we have at work are much the same as when reported on the 28th inst., our lode not being very changeable in its character; consequently, its productiveness is pretty regular. The ends are producing stuff of a very good quality, and are laying open profitable stoping ground. All operations throughout the mine are vigorously carried on.

WHEEL UNY.—Wm. Rich, Matthew Rogers, June 25: The lode in the rise in the 160 west is worth 10/., per fathom. The ground is easier in the bottom of Hind's engine-shaft, and the lode looking likely to improve. Other parts of the mine are without material alteration since our last report. We sold on Saturday last 10 tons of tin towards the next account.

FOREIGN MINES.

ST. JOHN DEL REY.—Telegram from Morro Velho, dated Rio de Janeiro, June 17: Produce eight days, first division of June, 9500 oits.=3881/.; yield, 5 1/4 oits. per ton=67 by old measurement.

—Telegram, dated June 23: Profit for the month of May, 6200/.

DON PEDRO.—Telegram from Rio, dated June 23: Produce cleaned up (first division of June), 300 oits. Sinking resumed.

ALMADA AND TRILLO CONSOLIDATED.—Telegram from Mr. Breach, June 5: Profit for May, \$2000. Drought causes scarcity of water in reduction works. Labour scarce.

RICHMOND CONSOLIDATED.—Telegram from the mine at Eureka, Nevada: Week's run, \$73,000, from 1030 tons of ore. Refinery, \$80,000.

—R. Rickard, June 5: Since my last operations both in mine and furnaces have been carried on with usual regularity. The winzes below the 200 is not looking so well as it was; the ore is of low grade. The 400 main drift is without change, still in hard limestone. The winze below the 400, between Nos. 1 and 2 chamber, is down 70 ft. on the contact of quartzite and limestone. The chambers are without any change since my last report; they are turning out the usual quantity of ore, and show no signs of diminution; the ore has not been of so high a grade for the past two weeks. Now that we have a connection made from No. 4 chamber to the 400 level the grade of ore will improve. The 500 cross cut is without change, still in very hard ground. A rise has been started in the back of the 800, on quartzite, to connect with the 500 for ventilation. The 800 is about the same, the ore body is not opening any wider. The rise in the back of the 900 is up 50 ft. in low grade ore, and occasional bunches of galena. We shall soon begin to sink below this level. The furnaces are smelting the usual quantity of ore, and are in very good working order.

FRONTINO AND BOLIVIA.—The directors have received advices, dated May 13, accompanied by a remittance of gold valued at 2798/.

The accounts for April show—233 tons treated, produced 790 ozs. of gold; average yield 2 ozs. 15 dwts. per ton; 382 1/2 ozs. of gold purchased from miners on tribute—1173 1/2 ozs., value 2798/.

Mine cost at Bolivia and expenses in London and Medellin, 1274/.

paid for gold dust, 820/., together, 2094/.

profit, 702/.

In addition to the monthly cost of 1274/., 169/.

has been spent on capital account. During the month 89 1/2 tons only were treated from the Silencio Mine, which produced 453 ozs. of gold, or an average of 5 ozs. to the ton.

The Paimchala produced 71 ozs. from 54 tons, or an average of 1 1/2 ozs. to the ton.

ANTIOQUIA (Frontino).—The directors have received a remittance of gold valued at 308/.

The accounts for April show—76 tons treated produced 108 ozs. of gold, or an average yield of 1 oz. 8 dwts. per ton, value 308/.

Cost at the mine and in London and Medellin, 394/.

showing a loss of 88/.

GOLD RUN (Hydraulic).—J. A. Stone, June 2: I made a general clean up the 25th ult., and took the gold to the mint, which coined \$2129.63.

On the 30th ult. I cabled you the result of the clean up. I exploded a blast of 300 kegs of powder at midnight, yesterday, which did good work. I am too ill to write you fully to-day, but will at my earliest convenience. Enclosed find first of exchange \$3000 (6122.10/).

BLUE TENT.—D. T. Hughes, June 1: We washed very vigorously in the South Yuba during the past week late and early, in order to be able to use the water, as we could not wash steadily at Blue Lead, owing to cleaning up, moving monitor, &c., to the upper bench, where we have commenced piling. We are progressing favourably with the powder drifts at South Yuba, and intend cleaning up the latter part of next week, which I think will be a favourable one. Everything is working well, and there is plenty of water in our ditch.

COLORADO UNITED.—June 25: The superintendent's letter to hand this morning, dated June 8, advises—The mine (Terrible) is looking very well, particularly in the 8th level, where some of the ore assays 8700 ozs. per ton, and a specimen went as high as 14300 ozs. per ton. In the 7th level they have got into good mineral. He says—"In the east end of No. 4 stop, 7th level, there was a great deal of barren rock, which we have now beaten away, and the west end is now looking well, and producing good mineral. We shall have a great deal of ore from this stop during the month." Of the silver ore tunnel he says—"A slide or fault has pushed the upper Brown lode to the north I have not the slightest doubt, otherwise we should have intersected it before this. The tunnel is now in 100 ft. and we must be very near the lode. Of the dressing works he says—"Before I submit my next monthly report the company's concentrating works will be in full operation. Work on the Brown is confined to stoping.—Lower Level: Ore value, first class, 200 ozs.; second class, 75 to 100 ozs." Of the Union tunnel drift—"Stopping west to rise to 67. This stop has opened out better than I expected, and you know how high my expectations were for big mineral here—it simply looks splendid. In conclusion, I beg to assure the board that in less than three weeks time, bar accidents, the dressing works will be started up, and by October 1st, I am confident, free from debt, will be enabled to declare a dividend. Of this I feel confident."

TOLIMA.—June 27: Frias: April returns, \$7850 7/8; expenses, \$6400 3/8; profit, \$1390 3/8, equal in sterling to 331/.

The agent reports 27 1/2 ft. 3 in. of ground expended, of which 3 fms. 2 ft. 8 in. were unproductive, leaving 23 fms. 4 ft. 6 in. of productive ground. The underground agent reports as follows: In the 40, east on main lode, the vein in the breast contains a mixed branch of argenteiferous lead and blende, the vein in the centre of the drive is from 3 in. to 4 in. in width, and in the roof and sole about 8 in. wide, good ore for stoping is being laid open by this level. In the 40 stopes east of winze we commenced stoping above a few days ago, and good export mineral is being broken from the vein. In the 40, west, the trial has again become poor, and the vein, although kindly, is at present devoid of mineral. The end must go forward however. In the 30 stopes the eastern face contains a good course of argenteiferous blende, but less associated with rich galena than before. The western portion of the stopes likewise yields good average mineral. In the sink beneath the 30 near the eastern extremity of the stopes, and to the point of the horse, paying mineral is being extracted, but I wish to see the vein more composed, and the ore more concentrated than at present. In the 20, east on main lode, the vein in the breast is at present disordered and impoverished. We do not expect any improvement until the level is extended beyond the disturbed ground. In the 30 cross-cut south the cross-cutting in the 30 west has been resumed with the view of exploring this section of the mine more effectually.—Esperanza Shaft: This shaft has been holed to the 30, but the remainder of the month will be required to square up to the full dimensions.

A short distance above the 30 the lode takes horse, and the two walls diverge to a width of nearly 3 fms., the central portion mainly consists of a large and unproductive mass of hard crystalline slates, the footwall carries a branch of almost solid argenteiferous galena 2 to 3 in. thick, whilst on the hanging-wall there is also a small branch of less rich mineral. We think the divergence of the walls will not be continuous, and that when they again converge we shall find the mineral more concentrated and less expensive to vein. In the 20 east the driving on the main lode has been resumed; the vein presents a congenial appearance, and specks of mineral are occasionally seen. In the 20 west the vein on the north or hanging-wall is large and massive, but its yield is still limited to non-argenteiferous pyrites. We have not been seen for several fathoms, to prove the lode up to the footwall, which has not been seen for several fathoms.—Surface: We have made some further modifications on and additions to the dressing floors. Hunt's jigger being in too dilapidated a condition to work with-out great waste of water taken from the large wheel, we have commenced the building of a new one in such a position as to be driven independently of any other machinery. The wheel for the jigger will be constructed large enough to drive a small battery of stamps additionally.—Alto Gold Mine: We have continued the washing by native process, but making occasional runs with the hydrant as water permitted. The Easter holidays delayed the running however. A partial clean-up of one of the cut on the 7th instant resulted in 11 cwt. 8 dwts. of good amalgam. We shall have a more general clean-up next week. We have not yet retorted the gold on hand.

EBERHARDT AND AURORA.—Capt. Drake, May 29: John Wild North: The assays reported in my No. 328, the 20th inst., are the last I have had made. There is no trouble to find rock that will assay fairly, but the ledge thus far developed is so broken and mixed with low grade matter that I can as yet save from it but a small amount of ore. I am fully aware that, considering our expenses in prospecting this ground, to obtain any good satisfaction for our outlay we must find some extent and quantity of good ore as well as a trial of the sample assayed. The value of the ore we have as yet broken is but a trifle of the expense incurred in working here; our expenses in carrying on this work are, indeed, considerable. We find some ore as already reported; and although a portion of it shows well, it is not yet developed into paying quantities, as, indeed, I believe it eventually will be. It is by all means desirable at present to avoid in every way practicable any increase of our monthly expenditures. I now need more men in the North Aurora Mine, and to avoid increasing our expenditures I think it advisable to temporarily suspend work in the John Wild North, and transfer the men to work in the North Aurora, which I have decided to do on the 1st prox. I am also led to this step by the fact that last winter when the mine dump and chute became filled with assorted ore (700 tons) the assayers, who were also miners, were put to work in the mine. We commenced hoisting from the mine on the 20th inst. Our hauling of ore has now so relieved the assorted dump that the assayers have been returned to work in the assaying-room, thus reducing our mining force underground. In a few weeks we commence milling, and it is certainly desirable that we should have as much ore for the run as we can possibly get. I am pleased to say the showing of unbroken ore in the mine is more encouraging than last reported, and may still further happily improve. But we do not know a great deal beyond what we can see.

June 5: As proposed in my No. 329, with the close of last month I suspended work in the John Wild North, and have transferred the men to work in the North Aurora Mine.—North Aurora Mine: I am pleased to say the ore that we have been following in the mine continues quite encouraging; the present appearance is more favourable for a continuance of ore than we have had in the last few weeks. Hauling: In the past week we have had two severe snow storms—a part of the mine was too rough for hauling, but during the week the teams delivered at the mill 64 tons. Tuesday: The fact is in breaking ground, but no material change in the character of the rock. Everything running well as usual.

PROVIDENCIA AND NEW ROSARIO.—M. V. Cumins, May 29: The operations of the fortnight have proceeded without any material change. The San Miguel winze has now reached the depth of 25 varas (about 60 ft.); owing to a slight change that has taken place within the last two or three days, I have resolved to sink for a week longer. I advised the board in my last letter that we purposed trying the lode with levels, but in consideration of the very small capital at our command we shall fix a stull in the winze, and commence to stop both ends from the top. If the ore is found to long, we will, of course, follow it, and make room for more men as we proceed. By this process we shall have more ore from the lode with greater certainty and with less loss than driving levels. The ore obtained from the winze would average about nine to ten guineas per ton. In San Miguel back there is no change; the communication of the rise with the winze above has been effected, and the ends are now being stoped as far as the ore is found to hold. In the eastern cross-cut of the San Miguel north level there is likewise no alteration, and unless the lodes of the south-eastern cross-cut have varied their course, we ought to intersect them in about 2 varas from the top. The fortnight's extraction amounts to 35 cargas (about 5 tons), worth about nine to ten guineas per ton.

PLACERVILLE GOLD QUARTZ.—T. Price, jun., June 3: On May 31 I cabled as follows:—"I have examined the mine, I have investigated the matter fully, and sent details and specimens by mail. I am favourably impressed. From indications there is a fine body of ore coming in the bottom shaft. Ore is improving in quality as it is being further developed. Have had samples assayed from the face with following results—\$10 to \$100 per ton. Air is too bad to permit progress in mine. Driving 52 ft. drift for ventilation." I have been progressing very slowly with the work at the mine—in fact, I was compelled to do so, as I was determined to make no false move. After unwatering the mine and finding it impossible to work to any advantage in the bottom of the shaft for the lack of air; in addition to which I did not deem it safe, as I did not know the exact locality of the old works, which I knew must be full of water. I, therefore, had the old tunnel cleared out, and have now reached Y (sheet of profile through A B). We are now clearing the cave, and are well through it. Found the incline full of water, as expected. The depth of this incline is supposed to be 90 ft. below the tunnel. I could not enter the old works, I have consequently commenced a drift slowly with the work at the mine—in fact, I was compelled to do so, as I was determined to make no false move. After unwatering the mine and finding it impossible to work to any advantage in the bottom of the shaft for the lack of air; in addition to which I did not deem it safe, as I did not know the exact locality of the old works, which I knew must be full of water. I, therefore, had the old tunnel cleared out, and have now reached Y (sheet of profile through A B). We are now clearing the cave, and are well through it. Found the incline full of water, as expected. The depth of this incline is supposed to be 90 ft. below the tunnel. I could not enter the old works, I have consequently commenced a drift slowly with the work at the mine—in fact, I was compelled to do so, as I was determined to make no false move. After unwatering the mine and finding it impossible to work to any advantage in the bottom of the shaft for the lack of air; in addition to which I did not deem it safe, as I did not know the exact locality of the old works, which I knew must be full of water. I, therefore, had the old tunnel cleared out, and have now reached Y (sheet of profile through A B). We are now clearing the cave, and are well through it. Found the incline full of water, as expected. The depth of this incline is supposed to be 90 ft. below the tunnel. I could not enter the old works, I have consequently commenced a drift slowly with the work at the mine—in fact, I was compelled to do so, as I was determined to make no false move. After unwatering the mine and finding it impossible to work to any advantage in the bottom of the shaft for the lack of air; in addition to which I did not deem it safe, as I did not know the exact locality of the old works, which I knew must be full of water. I, therefore, had the old tunnel cleared out, and have now reached Y (sheet of profile through A B). We are now clearing the cave, and are well through it. Found the incline full of water, as expected. The depth of this incline is supposed to be 90 ft. below the tunnel. I could not enter the old works, I have consequently commenced a drift slowly with the work at the mine—in fact, I was compelled to do so, as I was determined to make no false move. After unwatering the mine and finding it impossible to work to any advantage in the bottom of the shaft for the lack of air; in addition to which I did not deem it safe, as I did not know the exact locality of the old works, which I knew must be full of water. I,

fornight ending June 14 the receipts were 377%, and the passengers 30,036. The new capital is required for the extension of the line and additional rolling stock.

FOR COPPER, TIN, LEAD, &c., apply to—
MESSRS. PELL, BOYLE, AND CO.,
SWORN METAL BROKERS,
ALLHALLOWS CHAMBERS, LOMBARD STREET, LONDON.
 (ESTABLISHED 1849.)

METAL MARKET—LONDON, JUNE 28, 1878.

the fact that the market is not so much advanced. But let us once again give a more detailed account of the reports we receive from the various iron districts in England; the trade will then be able to form their own opinion as to the probable cause of near events. Apparently there is no new feature of interest to be reported from any one district; prices have remained without variation, though masters in this district have instances been very firm in their quotations. Particularly does this appear to have been the case at South Durham and the Cleveland district, from whence it is stated that makers, rather than have given rise to a downward movement in the 43s. 6d. for No. 1, 39s. 6d. for No. 2, and No. 4 forge 39s., to meet buyers in the districts, but seemingly without any advantageous results for themselves, as most buyers cannot afford to pay the present rates, much less anything above the ruling prices. It is, therefore, absurd, as we have previously stated, for masters to keep holding out in their quotations, as it is hard to believe they are so blind that they cannot see their folly, as merchants are totally unable, without positive loss to themselves, to purchase iron at higher rates than their indenter's limits will allow.

The demand for manufactured iron does not improve, and prices do not alter from 67s. 2d. to 67s. 6d. for thin plates, it being stated that a much larger proportion of business is transacted at the former rate than at the latter, consumers often resort to the trade to give out orders at the last-named price. Angles are quoted at 51s. 12s. 6d. and pulled bars at 37s. 15s. per ton net. A limited demand exists for bars at prices as last quoted. No change is stated to have taken place on the market at Leeds, and no improvement is anticipated at this district until the result of the Congress is made known. With but few exceptions all the mills appear to be working only short time, and are all very badly off for orders. The way appears to be the case with all districts at the Rothensham and Thoresby, from where it is stated that the demand for all descriptions of iron is extremely dull, and particularly for manufacture. With but few exceptions all the works are stated to be employing only short time, and the number of hands in occupation is said to be only what it was five or six weeks ago. It is also reported that but few of the works are working more than four days per week, and many only three days. Little or no alteration has taken place in prices, and hardly any variation is expected until business makes some satisfactory turn. It is stated from Barrow-in-Furness that hardly any perceptible alteration has taken place in the market for the whole of this year, business being very flat, and, as the market has been for the time showing but slight variation, the present rates are being offered for No. 1 Bessemer 61s. per ton, and No. 3 forge 57s.; while for the same quality of iron made by the puddle process was quoted at the beginning of the year. Makers are said in this district to have been manufacturing iron at lower figures than what the ruling rates are stated to be, and few and small transactions are reported as having been negotiated.

[illegible]

Dross	7,016
Total decrease for 1878	31,168
Imports of Middlesbrough pig-iron into Grangemouth:—	
For the week ending June 22, 1878	6,910 Tons
For the week ending June 23, 1877	6,540
Increase	270
Total increase for 1878	3,350
FURNACES.	
In blast June 23, 1877	108
In blast June 22, 1878	92

SPELTER.—Prices of Silesian is rather better, but hard is difficult of sale. At public sale yesterday about 130 tons of zinc was sold at 20 $\frac{1}{2}$ 15s. to 21 $\frac{1}{2}$ net, usual sale terms. From New York market is reported quiet and dull, the small business in progress being insufficient to impart any life to the market, or render prices more than nominal. The lower qualities of domestic are quoted at 4 $\frac{1}{2}$ c., and the better grades 5 $\frac{1}{2}$ c.; refined, 8 $\frac{1}{2}$ c.

LEAD.—The general demand does not appear to have undergone any material change, but holders are asking more money as a

TIN-PLATERS.—The market remains very quiet, but without change in quotations. The market report from New York states that tin is a firm market there, with a fair enquiry. I. C. charcoal, \$5 1/2 to \$6 1/2 c.; I. C. coke, \$1 87 1/2 c.

TIN.—This metal has been very variable. The market commenced well with the week, and sellers were induced to hold off for a time, which, however, they were not destined to realise, the buyers ceasing at 62 1/2. From this figure a sudden drop occurred to 62. The upward movement was said to be chiefly occasioned by the purchases of one house and as the same house suddenly turned round and sold, the market at once entirely collapsed. It is strange how one operator follows close upon the heels of another, and the market is consequently kept in a very tickle and sensitive position. There are few who seem to possess an eye for the market, and it is difficult to see the proper course to pursue. The market happens to rise a few shillings and everybody in the earth had opened and swallowed it all up, but let it be only a few shillings and everybody wishes to sell, and it quickly transpires that everybody else is to do the same thing. This is being guided with what other people are doing and not by circumstantial knowledge or sound reason. The main point to be considered is at the production; we can fairly estimate the consumption, but until the rate of production can be satisfactorily ascertained nothing can be effected. The advices from New York state the market to be extremely quiet, with some enquiry for any description, and the stock is given at 1700 tons, which is considered excessive.

THE IRON TRADE.—(Griffith's Weekly Reporter).—Friday evening G. M. B. Scotch pig-iron has been steady this week. A few thousand tons changed this morning on the Glasgow Exchange at 50s. 1 1/2 d. The market for this afternoon 50s. 1d., buyers. The price last Friday was 50s. We have makers' No. 1 iron—Gartsherrie, 58s.; Coltness, 51s.; Calder, 58s. 6d.; in 16 lb. 50s. 6d.; Summerlee, 57s.; Monkland, 51s., f.o.b. Glasgow. Glasgow 50s. 6d.; Ezlington, 51s., f.o.b. Ardrossan; Shotts, 59s. f.o.b. Leith. The Birmingham Quarter-day will be held on the 11th of July, 11, in the Iron Exchange of that city. The quarterly meeting is decided to continue the present price of iron during the quarter. It is decided, or, in other words, marked Staffordshire bars for the next quarter be 8. 10s. The Earl of Dudley's brand, being 12s. 6d. extra, will be 9s. 10d. Pig-iron will remain nominally at the same price, based on 4 1/2 per ton for Staffordshire and Shropshire forge brands. The markets at Middlesbrough

Glasgow are firm; prices well maintained. The trade on the west coast, altered, but large buyers are waiting for a quarter's business. The business on our market this week has been very moderate. The present state of the demand this year has been for prompt deliveries. The present weather having diminished the output at the works, many difficulties occurred in the week's deliveries, and if the present growing weather continues this state of things will be intensified, and iron for prompt rolling and delivery will increase in value, for the puddlers will certainly do very little work in this hot weather. We regret very much to have to notice the suspension of the management of a very old and highly respectable firm in the Black Country, at this juncture. We believe the surplus in the estate will enable the firm referred to to continue in business for some time with the creditors. The firm has the warm sympathy of the whole trading community under this misfortune. We have no chance of the whole metal this week. Charcoal tin-plates are firmer, with more notice in the price well maintained; a good business doing in coals, but the ruinously low prices still prevail. This kind is being supplied to the Liverpool market by the Welsh makers.

—

The directors of the Cassel Tramways Company invite subscriptions for a further issue of 1000 shares, of 2*l.* 10*s.* each, at par. The tramway was opened on July 9 last, and has been worked by horse power with great success. For the week ending June 2 over 100,000 passengers were carried, and the receipts were 16*w.*, and for

TIN MINES are just the same as last week, and quotations of shares merely nominal. Dolcoath, 29 to 31; Carn Brea, 39 to 41; Tincroft, 10 to 11; Cook's Kitchen, 1½ to 1½. Wheal Basset, 6 to 7; the new lode intersected at the 115 continues worth 30¢ per fathom, and is said to be rapidly opening out profitable tribute ground. The agents hope to return 70 tons of tin during the next 12 weeks. This, with the copper (estimated at 400K), will pay the cost of the mine. Mr. Basset, the lord, has, we understand, reduced the dues to 1-50th, thus setting a good example to all the lords of mines. Wheal Agar, 3½ to 4; the 205 is improving. A branch of copper ore has been intersected in the new shaft, which it is hoped may lead to a good bunch, being only 25 fms. below adit. West Godolphin, 1 to 1½; Penruthry, 5s. to 7s.; South Condurrow, 11½ to 11½; South Crofty, 7½ to 8½; South Frances, 2½ to 3½; West Frances, 2½ to 3; Wheal Kitty (St. Agnes), 1½ to 2; Wheal Peevor, 6 to 6½; Wheal Unx, 1 to 1½; Wheal Granville, 34 to 32.

IN LEAD MINES very little business is doing, and our quotations are for the most part nominal. Roman Gravel, $7\frac{1}{2}$ to 8; the sale of ore here realised 1999 $\frac{1}{2}$; the lead (180 tons) brought 1901 $\frac{1}{2}$; blende (30 tons), 97 $\frac{1}{2}$ 10s. There is no particular change in the mine. Tankerville, $3\frac{1}{2}$ to 3 $\frac{3}{4}$; the sale here for the month realised 1013 $\frac{1}{2}$. Lead (80 tons), 830 $\frac{1}{2}$; blende, 183 $\frac{1}{2}$. South Darren, 40s. to 45s.; the 90 end continues worth 34 $\frac{1}{2}$ per fun., and the winzes blend at this level 35 $\frac{1}{2}$; but it appears that 6 or 8 ft. of the lode is also standard by the side of the winze. The different stopes are as productive as usual. Next week the mine will sample 40 tons of silver-lead ore. At Ladywell the sale of lead (25 tons) realised 229 $\frac{1}{2}$. 7s. 6d. West Tankerville, $\frac{1}{2}$ to $\frac{3}{4}$; the 86, south of shaft, is a lode $1\frac{1}{2}$ ft. wide, worth $\frac{3}{4}$ ton of lead per fathom; the stope is back, 1 ton per fathom: 20 tons of blende have been sold for 65 and 30 tons of lead ores sampled.

FOREIGN MINES.—Colorado United, 5½ to 6; Cape Copper, 33; Chontales, 10s. to 12s. 6d.; Don Pedro del Rey, 12s. 6d. to Eberhardt and Aurora, 7 to 7½; Flagstaff, 12s. 6d. to 17s. Frontino and Bolivia, 1¼ to 2; Javali, 7s. to 9s.; New Zaca, 15s. to 20s.; Last Chance, 1¼ to 1½; New Quebrada, 2s. to 2½; Port Phillip, 10s. to 12s. 6d.; Richmond, 12½ to 12¾. John del Rey, 305 to 315; full particulars of the meeting will be found in another column. Blue Tent, 3 to 3½. Huilafta, 4; the shaft has been timbered to the 25. A cross-cut has been driven 22 ft. towards the lode, and good stones of lead and blende are being found in the country. In another fathom of driving the vein will be intersected. The agent writes that in about a fortnight from the date of his letter—June 22—the fine crusher and additional buddles will be at work to perfect the dressing of the ore. The works generally are going on in a satisfactory manner.

St. John del Rey, 305 to 315; the latest telegram from Velho, dated Rio de Janeiro, June 23, states that the profit for 1907 was 6200*l*. The produce for the first division (eight days) of 1907 was 9500 oits., of the value of 338*l* 1*l*., the yield of the ore was 54 oits. per ton, or 67 oits. by old measurement. At the same time the Chairman stated that the produce and profit are both more than they were last year, and after paying 35 per cent. on the capital of 1907, and adding 10.47 per cent. to the reserved fund, they carried forward a balance of 20,170*l* 10*l*., compared with 2435*l* 10*l*. last year. The year's earnings have been divided into 10 shares, fully 40 per cent. on the capital, though they prudently have not done so before. The produce exceeds the produce of last year by 18,000*l*., whilst the profit is only 8000*l*. more. This arises from the absolute necessity there has

laying out more money in works of exploration, repairs, and additions to the machinery on the surface, and that they must be prepared for during the whole of the current year. Referring to the financial position of the company, he said that the remittances due in July will enable them to pay all liabilities up to August, and that the balance of the year will be a handsome one. They have now a reserve fund of £5,000, besides about £500 of unexpended capital applicable to the preliminary work at Culina.

Flagstaff, 3 to 3; it appears from the Salt Lake Tribune of June 4 and 5 that judgment had been given against the company in the Hulen Tarbet suit, on appeal, which practically limits the estate of the company to 100 ft. Proceedings are now being taken for an appeal to the Supreme Court at Washington. Judgment has also been given in favour of Erwin Davis and receiver (Mr. Gobath) appointed, who was to pay Davis's claim against the company, and all claims of creditors under the Patrick management. It is understood that delay has been granted under the Hunter management. In the meantime further evidence will be to the action of receiver of the company against such appointment. If this judgment should be substantiated it will be a nice question for the original debenture holders as to the validity of their security. It is presumed the directors and shareholders are aware of these untoward circumstances. Have they communicated the intelligence to the shareholders?

The latest advices from the Utah Mines state that as the snow disappears preparations are making for the spring campaign. Judging from present indications, considerable work will be done this year in developing the several mines.

Placerville Gold Quartz: the survey and examination of the mine by Prof. Price, after unwavering the shaft, has proved satisfactory. Lead Mines have been slightly more active, in sympathy with the animation of other markets and the improving tendency of the market for lead. Van, 23 to 24; the mine is looking well. The usual monthly report appears in another column. The sale on Thursday, 500 tons of lead and 150 tons of blende, realised 5990%. The directors have declared an interim dividend for the quarter ending this day (Friday) of 5s. per share, free of income tax, payable on July 10.

Grogwinion, 3 to 3; the sinking of the winze below the deep adit has been resumed, and is still going down in a fine lode, rich for lead. The new discovery in the deep adit last week is still looking well. Wye Valley, 1 1/2 to 2; the appearance of the winze between the 22 to 48 feet warrants the 1 1/2 to 2; this mine will soon resume its former prosperity, the ground having been entirely changed for the better, and resembling exactly what was in the upper levels when a rich deposit was found. Good quantities of ore are already being procured, and when time has been allowed for a communication to be effected between this winze and the 43 the manager feels confident that he will have as good a mine as ever, not excepting the period when the lode was valued at 8000 tons like 9 tons per fathom.

West Wye Valley, 2 to 3; the bottom level does not look so well, and appears to have entered a poor floor of ground similar to what was encountered in Wye Valley after exhausting the splendid deposits in and about the 10. Both these mines are on the same lode, and their characteristics are almost identical, so that what has been met with in one may fairly be expected to exist in the other. It may be that the 40 in West Wye will have to be driven through poor ground for a certain distance, but there can be no reasonable doubt that at deeper levels the lode will resume its productivity, meantime a certain amount of unprofitable development must be carried on. Caron, 2 to 2 1/2; all proceeding well at this mine. The lode maintains its value, and new discoveries are being made. Prospects excellent. Red Rock, 2 to 2 1/2; the mine continues to open out well at all points. Another parcel of lead will be ready for sale next week. Saint Harmon, 2 to 3; the cross out to the south lode is making good progress, and all other operations going on well. South Cwmystwith, 2 1/2 to 3 1/2; no change here.

West Pateley, 2 to 2 1/2; the agent (Capt. David Williams) has made a special report, which has been forwarded to the shareholders. Small quantities of lead ore being obtained from various parts of the mine. At one point the Craven Cross vein touches the north end of the shaft, which (sic) appears to be over 6 ft. wide, between the well defined walls. In this place they have a solid branch of galena on the north wall 8 to 12 in. wide, and in the west end a solid branch of ore, over 12 in. wide. The 56 is promising and yielding about 1 ton of lead ore per fathom. From the 25 west, which is in saving work, it is proposed to put out a cross-out south 40 fathoms to cut four parallel veins, which proved rich nearer the surface. No other points appear to be producing lead worth notice. Capt. Williams continues:—

"We have rebuilt the office, and a new smith shop and storehouse. We have also erected a 15-horse power Robey's patent steam engine for drawing, pumping, and sawing; a new carpenter's shop, with saw bench complete, and a powder magazine, also slides, jiggers, water-wheel, crusher, &c., for dressing; we also made five new ponds on surface for storing water, besides tramroads, cart-roads, &c. We have sold two parcels of pig lead, and have other 5 tons of ore towards another smelt. The mine continues to open out in a most satisfactory manner, and only requires time and money to carry out the above points, to prove it a lasting and profitable investment."

Great Wheel Rodd, 3 to 1; the mine continues to improve. Some rich stuff is now being brought to surface. Paracombe, 3 to 3 1/2; the agent writes that the mine is becoming much richer for silver-lead, and that No. 1 lode is worth 1/2 ton per fathom.

Subjoined are the closing quotations:—

Asherton, 3 to 1 1/2; East Van, 4 to 4 1/2; Glenroy, 3 to 1; Glyn, 1/2 to 3/4; Great Lacey, 1 1/2 to 1 3/4; Leadhill, 3 1/2 to 3 3/4; Pateley Bridge, 3 to 1; Penstruthal, 1 to 1 1/2; Red Rock, 2 to 1; Tankerville, 3 1/2 to 3 3/4; Van, 23 to 24; West Asherton, 1 to 1 1/2; West Chiverton, 8 1/2 to 9; West Pateley, 2 to 2 1/2; Almada and Tinto, 3 to 3 1/2; Birdseye Creek, 3 to 1; Cedar Creek, 3 to 1; Chontales, 3 to 3 1/2; Colorado, 1 1/2 to 1 3/4; Condes of Chilli, 1/2 to 3/4; Don Pedro, 1/2 to 3/4; Eberhardt and Aurora, 7 to 7 1/2; Emma, 1/2 to 3/4; Exchequer, 1-18th to 3 18ths; Flagstaff, 3 to 3 1/2; Frothing and Bolivia, 1 1/2 to 2 1/2; Huitfall, 4 to 5; I. X. L., 1-18th to 3 18ths; Javal, 1/2 to 3/4; Kapanga, 3 to 1; Last Change, 1/2 to 1 1/2; New Quebrada, 1 1/2 to 2 1/2; Oregana, 3 to 1; Postern, 3-16ths to 5 16ths; Port Phillip, 1/2 to 3/4; Richmond Consolidated, 1 1/2 to 1 3/4; St. John del Rey, 305 to 315; South Aurora, 1-18th to 3 18ths; Teoma, 3 to 3 1/2; United Mexican, 3/4 to 1 1/2.

COLLIERIES.—The market for these shares has been very quiet during the week, very few shares having changed hands, and no change of any moment appearing in prices. This is probably to be accounted for partly by the state of the markets for foreign and railway stock, in which prices have been rising to such a remarkable extent as to attract almost the entire attention of investors and speculators. A general feeling, too, that the coal trade has been at its worst and is now reviving has, no doubt, operated on the minds of holders of colliery shares, who begin to see that by selling in a depressed market they are really sacrificing not only their capital but the prospects of an early return of better times. From the one cause buyers have been scarce, while from the other cause sellers are holding back in anticipation of realising better prices soon. They certainly seem justified in this course by the condition of nearly all the coal and iron markets. The improvement in these is general, though at present not large, but a very hopeful feeling is abroad amongst coal and iron masters, and when this feeling is almost universal amongst those who are in the best position to judge we may take it that the improvement of which we have already seen signs, will really come. In Lancashire the coal trade has been improved by the reopening of the many cotton mills closed during the recent strike, and also by a revival in the general trade of the county, and hopes are entertained that a good rise will be seen in the prices of fuel. When the present uncertainty of political affairs gives way to the certainty of a peace of something like a reasonable duration an impetus will be given to the shipping trade of Liverpool, which has been much affected as that of any other port of the kingdom by the warlike clouds which have been hanging over us. The reports from Chapel House are, as usual, favourable and encouraging. The new engine is finished, and has had steam put into it, when it worked admirably. The steam-gauge, steam-brake, and one or two other minor parts have still to be fitted on to it, but it is expected that a day or two will suffice to complete these, and that the engine will be in full working order early next week, when the colliery will be immediately increased. A large proportion of the preference capital has already been subscribed, and the directors seem confident that the whole will be taken up once.

Coal shipments showed a slight falling off last week, but this appears to be owing partly to the increased home demand and partly to a temporary scarcity of shipping. The average will probably be made up again in the course of a week or two. We hear that the Yuseidwyn Company has numerous orders in hand for coal at prices which will yield a profit of 2s. per ton or upwards. The property is such an extensive one, and its plant is so complete, while it was acquired by the company at such a low price, that it cannot fail to make considerable returns, and to pay large dividends on its capital. The demand for coal still improves at Altrami, and a fair business must result on the general revival of trade. The demand for steam coal at Llay Hall is such as to give a cheerful prospect for the colliery. The shares close at 6 to 8. Chapel House ordinary 4 1/2 and 5 1/2; New South Wales, 4 to 4 1/2; New Sharnston, 3 1/2 to 4 1/2; Thorp's Gawber, 2 1/2 to 3 1/2.

The NEW WALLSEND COLLIERY COMPANY has been formed, with a capital of 40,000, in shares of 10s. each, to purchase for 21,000, the colliery of the same name, situated near the southern entrance of Lake Macquarie, about 41 miles from Sydney and 19 miles south of Newcastle, New South Wales. The property is freehold, 265 acres in extent, and commands the entire coast-line of a small and sheltered bay—Catherine Hill Bay—where a jetty has been erected, and every accommodation for loading steam colliers of 400 or 500 tons has been provided. The adjoining properties are those of Messrs. Pope and Hardie, and Messrs. Lamb and Brown. These have been favourably reported upon by Mr. MacKenzie, the Government Examiner of Coal Fields. Mr. James B. Winship, who has inspected the property for the company, says with reference to Mr. MacKenzie's report that nearly the whole of the area embraced by these properties consists of high broken ridges, ending abruptly on the eastern or coast frontage in steep cliffs, which in places afford good natural sections of the strata. Four different sections of coal can be seen outcropping in the cliffs on Messrs. Lamb and Brown's selection, and only one crop out on the New Wallsend property; but on the western side of it, and one of them, the uppermost or No. 1 seam, has been proved in a bachelore which Messrs. Pope and Hardie are now putting down at the western end of the 320 acres block, immediately adjoining the company's land. He also sees no reason to doubt that the No. 5 or Fallow seam, which is spoken of by Mr. MacKenzie and others to be identical with the Buchole seam, worked by the Australian Agricultural Company, underlies the New Wallsend property.

as well as two other workable seams of good coal which are found in the Newcastle district, between that seam and the upper seams. The coals from both seams were tested by competent people in Melbourne about two months ago, and were pronounced to be equal to the best coals sent to that market from this district for house, steam, or gas purposes.

The LUNGOJ GOLD MINING COMPANY, with a capital of 12,000, in shares of 1s. each, has been formed to lease and work the Upper Lungoj gold mine in Transylvania, under the local management of Mr. C. J. Harvey, M.E., for 15 years manager of the Port Phillip Company's mines. To place the mine in working order, drive levels, &c., erect necessary reduction works capable of treating 8000 to 10,000 tons a year, an expenditure, according to Mr. Harvey's estimate, of 9025s. will be required; he also estimates that a yearly profit of 4500s., or nearly 40 per cent., may be relied on after allowing for expenses at home and abroad, whilst a proportionately increased profit may be anticipated from any addition to the stamping power. Mr. Harvey appears to have taken a low average of the stuff, and the purchase money for the transfer of the lease is reasonable—2000s. in fully paid shares, and 400s. in cash, the latter being to reimburse the vendor the costs attending the examination of the property. The lease is to be for 21 years from June 1, 1878, for which the company is to pay 400s. to the lessor on signing, the lease 200s. per annum during the first four years, and 100s. per annum for the remaining 17 years, both merging into a royalty of 5 per cent. upon the value of the gold obtained. When the whole of the capital has been returned out of the profits the lessor is to receive a percentage on profits beyond 20 per cent. per annum. The lease is to be renewable at the option of the lessees upon terms to be mutually agreed upon. Mr. Harvey considers that the mine can be worked for years by adit level; it is near a main road in a country opened by railways, where labour is cheap and provisions plentiful, and that with these advantages it possesses a combination of all the elements calculated to make it a success. The prospectus will be found in another column.

The Stock Exchange Committee have ordered that the official quotation of the Colorado United Mining Company (Limited) be extended from 21,000 to 61,000 shares.

A petition has been presented to the High Court of Justice for the winding-up of the Patents Tunneling and Mining Machine Company.

With this week's Journal a SUPPLEMENTAL SHEET is given, which contains: Original Correspondence: Mining in Queensland; the Gold Mines of Brazil; Eureka, Nevada, Correspondence (J. D. Power); an Examination into the Position and Prospects of Certain Mines, No. IX—Colorado (W. Gabbott); Canadian Mining Notes—No. III.; Australian Tin; Port Phillip and Colonial Gold Mining Company (J. W. Purchase); Don Pedro North del Rey; Javal Gold Mine; the New Speculation—Gold Mining; Devon Great Consols (R. Symons); South Staffordshire Coal and Iron Trades; Rock Drills (E. Edwards); Ore's Dictionary of Arts, Manufactures, and Mines—Vol. IV.; a Protest. Pant-y-Mwyn Lead Mine; Paracombe Mine (T. Mitchell); Great Wheel Rodd (A. Wyatt); Reminiscences—No. IX.; The Paris International Exhibition—No. VII.; Foreign Mining and Metallurgy—the Rammelsberg Mine in the Lower Harz; the Scotch Mining Share Market—Apparatus for the Distillation of Coal—Preparing Peat—Patent Matters—Meetings of Chapel House Colliery, St. John del Rey, New Quebrada, Companies, &c.

WEST PATELEY BRIDGE.—It is now ascertained that there are two veins in the Craven Cross shaft, and that in the 35 fm. level there is a branch of almost solid ore 18 in. wide. The ore in the 63 (on another vein) is improving. The manager says: "We have here a splendid vein," and concludes a lengthy report as follows:—"The mine continues to open out in a most satisfactory manner, and only requires time and money to carry out the points now in progress to prove it a lasting and profitable investment."

WEST CRAVEN MOOR.—The prospects here continue to improve, and there is no doubt about the future of this favourable property. It bids fair to rival many of the best lead mines in the kingdom. The following are the principal points in operation, which show the value of the ore producing places. The lode in the end of Blackhill level is 7 ft. wide, worth 20 cwt. of lead ore per fathom. A stop in the back of the same level, 15 fms. behind the end, is worth 30 cwt. of ore per fathom. No. 3 stop, in the back of the same level, is worth 15 cwt. of ore per fathom. They have driven through a regular course of ore in the bottom for 50 fms. in length; in fact, they are opening up a fine mine here. In New East shaft, in the back of the 20, on No. 2 stop, on No. 2 lode, the lodes are worth 20 cwt. of ore per fathom. In No. 1 stop, in the back of the same level, the lode is worth 20 cwt. of lead ore per fathom. In New West shaft a course of ore in the bottom of the 20 west is worth 16 cwt. of ore per fathom. A stop in the back of the 20 east is worth 8 cwt. of ore. The forebreast of Blackhill level is within 68 fms. of this shaft, and will give 18 fms. of backs below the 20 fm. levels in East and West shafts. They have over 30 tons of ore now smelting.

EAST CRAVEN MOOR.—They are opening up a good mine here, and have many very important points of value. They have driven over a course of lead ore for 15 fms. in length, varying in value from 30 to 20 cwt. of ore per fathom, and will sink the shaft to the 54 to get under this ore ground. They have 14 lead producing lodes in this property, and time will prove it to be one of the richest lead mines in Yorkshire.

COAL MINES REGULATION ACT, 1872.

EXAMINATION FOR MANAGERS' CERTIFICATES OF COMPETENCY.

DISTRICT UNDER THE CHARGE OF THOMAS BELL, Esq., H.M. INSPECTOR OF MINES.

NOTICE IS HEREBY GIVEN, that an EXAMINATION for MANAGERS' CERTIFICATES OF COMPETENCY, under the above-named Act, will be HELD on the 29th day of July, 1878, and CANDIDATES INTENDING TO PRESENT THEMSELVES at such Examination must, on or before the 22nd day of July, notify such intention to the Secretary of the Board of the above-mentioned District, from whom all information as to particulars can be obtained.

By order of the Board,
G. W. BARTLETT, JUNR., Secretary.

Cleveland Parade, Darlington.
N.B.—Persons who do not reside within the District are equally eligible for examination with those who do.

GLAMORGANSHIRE.

WANTED, a PARTNER in a BITUMINOUS COAL COLLIERY, situated within three miles of a shipping port, and one and a half mile of the Great Western Railway. For further particulars apply to Mr. DAVID THOMAS, Mining Engineer and Estate Agent, Great Western Chambers, Neath.

WANTED, a PURCHASER for a RICH SILVER-LEAD AND BLENDE MINE, which is capable of yielding 200 tons of ore at a profit of £200 to £300 monthly, with certainty of increasing. Adjoining mine on same lode now making annual profits of over £20,000. Address, "C. J. R.," MINING JOURNAL OFFICE, 26, Fleet-street, London.

WANTED, a PARTNER, to JOIN in WORKING an IRON MINE in DEAN FOREST, fully opened. Apply for particulars to ATKINSON and VAUGHAN, Civil and Mining Engineers, Coleford, Gloucestershire.

A GENTLEMAN SEEKS an APPOINTMENT in ENGLAND or ABROAD who studied MINING and METALLURGY with ALLIED SCIENCES for four years. Since had several years experience. Treatment of Auriferous, Argenteous, and Cupreous ores and products a speciality. Highest testimonials, &c. Address, H. LATIMER, Post Office, Scorrier, Cornwall.

FOR SALE, at WEST HAM, on account of expiration of lease, a very economical high and low pressure and condensing BEAM ENGINE, complete, about 60 horse power, in excellent condition; also, TWO double flued Cornish BOILERS, about 20 ft. by 7 ft. Address, A. MACLACHLAN, Lime-street Chambers, E.C.

CAPTAIN ABISALOM FRANCIS, MINING AGENT, ENGINEER, AND SURVEYOR, GOGINAN, ABERYSTWITH. FOUR MINES CERTAIN FOR A RISE.

NORTH WALES. CORNWALL. SHERBORN. DURHAM. LANARKSHIRE. TURKEY (EUROPE). STRAITS OF MALACCA.

SOUTH WALES. DEVON. LINCOLN. NORTHUMBERLAND. FRANCE. TURKEY (ASIA). JAVA, &c.

A PRACTICAL MINE INSPECTOR, who has Surveyed and Reported on Mines in the above places, is prepared to REPORT on MINERAL PROPERTY. Address, "Miner," Dennis Rook and Co., Metal Brokers, 46, Leadenhall-street, London.

J. J. ARIS AND CO., MINING ENGINEERS, MINERAL AND METAL MERCHANTS, 29, FENCHURCH STREET, LONDON, E.C. Mines inspected and reported upon.

ZINC ORES.

ARMAND FALLIZE.

INGENIEUR-CIVIL, A LIEGE (BELGIUM).

1.—CARBONATED AND OXYDED ZINC ORES (CALAMINE, &c.)

2.—ZINC AND LEAD ORES MIXED TOGETHER, BUT DRESSABLE KINDS ONLY

CAPPER PASS AND SON, BRISTOL

PURCHASERS OF

LEAD ASHES, LEAD SLAGS, SULPHATE OF LEAD, HARD LEAD, BRASS SLAGS AND ASHES, COPPER REGULUS, MATTE, SCORIA, TIN ASHES, TERNE ASHES, &c., and MIXED ORES or REFUSE, containing LEAD, COPPER, TIN, or ANTIMONY.

WALTER ROY AND ALLAN,

184, BUCHANAN STREET, GLASGOW.

EXECUTE COMMISSIONS FOR THE PURCHASE AND SALE OF SCOTCH FIG-IRON WARRANTS.

Sole Agents in Scotland for—

SPEAR AND JACKSON, Etna Steel Works, Sheffield; and JOHN SHAW, Yorkshire Wire Rope Works, Sheffield.

Steel and Steel Tools, Pig and Manufactured Iron, Hemp and Wire Ropes for all purposes, India-rubber Goods, and Furnishings of every description for Leries, Founders, Engineers, Saw-millers, &c.

GEO. G. BLACKWELL,

5, CHAPEL STREET, LIVERPOOL.

PURCHASER OF

MANGANESE, ARSENIC FLUOR-SPAR, WOLFRAM, BLENDE, CALAMINE, CARBONATE AND SULPHATE OF BARTES, ANTIMONY ORE, CHROME ORE, MAGNESITE, EMERY STONE, PUMICE STONE, OCHRES AND UMBERS, CHINA CLAY, LEAD ORE FOR POTTERS, TALC, PHOSPHATE OF LIME, &c.

HENRY WIGGIN AND CO.

(LATE EVANS AND ASKIN).

NICKEL AND COBALT REFINERS

BIRMINGHAM.

ASBESTOS.

THE BEST MATERIAL for the STEAM JOINTS of LOCOMOTIVES, MARINE and STATIONARY ENGINES BOILERS, &c.

It is manufactured entirely pure, and of the best and strongest qualities, into MILLBOARD, for STEAM, WATER, GAS, and ACID JOINTS.

Further particulars and prices of the undersigned,

SMITH, FLEMING, AND CO.,

17 AND 18, LEADENHALL STREET

LONDON, E.C.

Exhibition Prize Medal—New South Wales, 1877.

AUSTRALIAN TIN—"KANGAROO" BRAND.

Having recently succeeded in REFINING the AUSTRALIAN TIN to the HIGHEST PITCH OF PURITY, the Undersigned is prepared to SUPPLY an article equal to the BEST REFINED ENGLISH.

The uniform assay of the "Kangaroo" brand ranges from 99.70 to 99.99 pure tin. An exhaustive comparative trial of various brands of Australian tin (see annexed report) have proved the

"KANGAROO" BRAND

To be superior to all other Australian tin, and equal to best refined English.

COPY OF REPORT.
"Sydney Galvanising Works, Sydney, Oct. 1, 1877."
"DEAR SIR,—I have much pleasure in stating that I have found the tin smelted at the 'Kangaroo' Tin Smelting Works superior to any other Australian smelted tin I have used in my business up to the present time, and in no way inferior but quite equal to the celebrated 'Lamb and Flag' tin. This opinion has been arrived at after several carefully executed practical tests, as well as from metallurgical assays."

"I am, dear Sir, yours faithfully,
(Signed) S. ZOLLNER."
Messrs. JOHNSON, MATTHEY, AND CO., the well-known Assayers, report on 24th December, 1875, on a shipment ex Durham, 25 tons of "KANGAROO" TIN, 99.95 per cent. pure tin.

In ordering the "Kangaroo" brand the trade will henceforth ensure uniformity of quality, excellence of texture, and absolute freedom from impurity.

"KANGAROO" TIN SMELTING WORKS.

Sydney, September, 1877. S. L. BENSUSAN.

MR. W. MARLBOROUGH, STOCK AND SHARE DEALER, 29, BISHOPSGATE STREET, LONDON, E.C. (Established 21 Years), can sell the following SHARES, at prices annexed:—

100 Aberdaunt, 25 Frontino, £2. 10 Richmond, £12 12s 6d
30 Bodirrey, 25s. 40 Flagstaff, 10s. 3d. 18 Roodhope, 17s. 6d.
40 Birdseye, 20s. 15 Gorsead & Merl, £4. 10 Rossa Grande, 2s. 3d.
10 Blaen Oaelan, £4 5s. 23 Grogwinion, £3 7s. 6d. 50 So. de Eresby, £1 7s 6
50 Chontales, 11s. 6d. 40 Huitfall, £3 11s. 3d. 10 Tanterville, £3 11s. 3d.
10 Chapel House, £3 5s. 25 Last Change, £1 7s. 6d. 10 Tankerville, £3 9d.
15 Colarado, £3. 40 Morladu, 12s. 9d. 40 Tyn-y-Fron.
40 Don Pedro, 13s. 30 N. Zee. Kapanga, 15s. 3 Tyn-y-Fron.
2 D'Eresby Con., £9 5s. 20 Pandora, 15s. 5 West Chiverton, £9 1/2
10 East Van, £4 3s. 9d. 15 Pant-y-Mwyn, £3 1/2. 5 W. Craven Moor.
10 Eberhardt, £7 1/2. 25 Pateley Bridge, 19s. 20 W. Wye Valley, £2 1/2.
50 Exchequer, 2s. 6d. 50 Parys Mount, 9s. 3d. 90 Yorke Peninsula, 5s.
10 E. Caradon, 6s. 9d. 40 Port Phillip, 11s.

Shares bought and sold at net prices. Telegrams promptly attended to. Specially Recommended for an early rise in price: Gorsead and Merilyn, Bodirrey, Tyn-y-Fron, Huitfall, Pandora and D'Eresby Mountain.

WILLIAM B. COBB, STOCK AND SHARE DEALER, 62, CORNHILL, LONDON, E.C. Bankers: The Alliance Bank (Limited). HORNBACHOS.—Special business in these shares.

MR. TIMOTHY HUGHES, MINING AGENT AND SHAREDEALER, 59, SEEL STREET, LIVERPOOL. Reliable information given respecting Welsh and Manx Mines.

In the Press. No. I. ready in a few days, post free three stamps, or 2s. 6d. the whole series.

"FINANCIAL NOTES," or the MONEY-MAKER: In Twelve Numbers, forming together a complete and valuable Guide to Investors and Business People. The whole series will form a volume of reference and matter not otherwise obtainable, and from the pen of an able Financial. Each number will contain a list of good paying securities on the rise, and debentures and shares for profitable investment.

Published by Messrs. THOMPSON and Co., Stockbrokers, 27, Mansion House Chambers, Queen Victoria-street, London, E.C.

LEAD ORES.

Date.	Mines.	Tons.	Price per ton.	Purchasers.
June 27—Van	250	£11 1 0	Walker, Parker, and Co.
— ditto	25	11 7 6	Adam Eytton.
— ditto	100	11 3 0	Panther Lead Co.
— ditto	25	11 7 6	Sheldon, Bush, and Co.
— ditto	50	11 5 6	St. Helen's Company.
— ditto	50	11 2 6	ditto
— Roman Gravels	80	10 11 0	Walker, Parker, and Co.
— ditto	50	10 12 0	Nevill, Druce, and Co.
— ditto	50	10 11 0	ditto
— Ladywell	25	9 3 6	George Burr.
— Tankerville	80	10 7 6	ditto
— ditto	20	9 3 0	Runcorn Company.

HORNBACHOS (Silver-Lead).—This company sold to Messrs. Nevill, Druce, and Co., on June 20, 68 tons 16 cwt. 1 qr., for 1519s. 2s. 11d.

BLENDE.

Date.	Mines.	Tons.	Price per ton.	Purchasers.
June 27—Van	75	£2 16 6	Vivian and Sons.
— ditto	25	2 16 6	Dillwyn and Sons.
— Roman Gravels	80	3 5 0	Vivian and Sons.
— West Tankerville	20	3 5 0	ditto

Notices to Correspondents.

CHAPEL HOUSE COLLIERY.—In the letter on this colliery, in last week's Journal, the name of the manager should have been printed Mr. Loughran.
Received.—"H. B." (Balen): The paper shall appear next week—"A Subscriber" (Utah) should send us full particulars, when the matter shall be noticed—"Cornubensis" (Gwennap): The returns are published in the Journal quarterly—"M. B." (Ochester): We believe so—"H. R. M.": The Eureka is an American Company, and the address is San Francisco, U.S.A.—"C. W." (Serra de Coques): We should like to hear the decision arrived at—"Shareholder" (Wheal Grenville)—"An Old Reader" (Hanley)—"Shareholder" (Wheal Favour)—"Shareholder" (Richmond)—"T. C." (Swansea).
 MINING JOURNAL CASES, to hold one month's numbers, can now be obtained at the Office, 26, Fleet street, London, price 2s. 6d.

THE MINING JOURNAL, Railway and Commercial Gazette.

LONDON, JUNE 29, 1878.

DISASTERS IN MINES.

The discussion initiated in the House of Commons by Mr. MACDONALD as to fatal accidents in mines, irrespective of his heavy and lengthy statement and copious extracts quoted from the Government Inspectors' reports, was the means of bringing out some valuable suggestions and practical views as to the best means of preventing those terrible catastrophes in our collieries from explosions of fire-damp, which of late have been of painful frequency. In addition to the statement of the Member for Stafford, we had the opinion of Mr. BURR briefly and modestly given in that straightforward manner that always carries conviction, and ensures for him the sympathy of his auditors. On the other side we had the experience of Sir GEORGE ELLIOT, one of the highest authorities as a mining engineer in the kingdom, and of Mr. A. KNOWLES, the well-known Lancashire colliery owner, whilst Mr. CROSS, the Home Secretary, in an able speech showed the deep interest he took in the subject. It is, however, to be regretted that the attendance of members was thin, for the question was treated in an able manner, and at the same time was instructive to those who had not paid much attention to the working of coal mines, and the dangers those are liable to who work in them. But the fact is that Mr. MACDONALD has the reputation of being a persistent talker and chronic questioner on almost every subject, and is looked upon in the House as a thorough bore, hence the limited number of hearers. The honourable member, however, had plenty of information to give, being well up in the subject, and made a long and laboured speech, but his drearily spun-out oration with long quotations from the Blue Books, given with that affectation of superior knowledge and pronounced accent so peculiar to Mr. MACDONALD, fell flat upon the ears of those whose sympathies were with the object of the speaker, who, had he occupied one-half the time, or even less, would have been far more effective. As it was, however, some of the quotations from the reports of Inspectors of Mines were to the point, and could not fail to attract the attention of the limited and critical audience who listened to them. From the reports, as well as from the verdict of juries, it was shown that the Acts of Parliament had not been complied with, whilst the recommendations of the Inspectors had been neglected by those who had charge of collieries. To prevent such accidents as those that had recently startled the public by explosions in mines, Mr. MACDONALD gave it as his opinion that there would be no improvement until there was a more efficient system of inspection—a constant inspection—so as to see that the rules and regulations were properly carried out, that the managers were careful and experienced, and the ventilation properly maintained. Mr. MACDONALD concluded by contending that the present inspection of mines was illusory, that the disasters were not to be attributed to the negligence of the miners, for the power of preventing them was in the hands of the owners, whilst the 61st clause of the Act which provides that any manager, owner, or workman, who does anything that tended to the injury of another should be liable to three months imprisonment had never been put in force. He accordingly moved a resolution to the effect that the Government should at once take steps to see that the inspection ordered by the Mines Regulation Act of 1872 be enforced.

That our collieries are not duly and fully inspected seems to lie heavily upon the heart of Mr. MACDONALD, yet from the reports for last year we find that the Inspectors have not been neglectful of their duties in that direction. That our Inspectors should make a daily inspection of the mines in their districts at the present time is simply impossible; but even could they do so it would most certainly be detrimental to the safety of the miners, and to the general discipline of the mines. A colliery manager is supposed to be attending to his duties at all reasonable times, more especially when the men are at work, prepared for any emergency that may arise. But were an Inspector to make a daily visit of two or three hours, and state what was to be done, then the manager and owner would be relieved of all responsibility, which would fall upon the shoulders of the Inspector in the case of an accident. Surely if a competent manager, spending his time at the place where he has sole control, cannot be trusted to look after one colliery, how can an Inspector who is connected with not one in particular, but looks after a large number, be answerable for the ventilation and the general working of all of them. Even were the number of Inspectors ten times greater than at present, the views of Mr. MACDONALD upon this part of his discourse could not be carried out. Explosions, we know, will take place despite the most vigilant attention and the greatest possible caution, for gas will accumulate from coal seams or from the roof or the bottom without giving any warning whatever, and may occur ten minutes or less after the workings have been examined by an Inspector, as well as when they have not been inspected for a year or two. But inspection has worked remarkably well indeed, and we believe has done nearly all that could be expected of it. The first Act for the inspection of mines was passed in 1850, and in 1855 the number of deaths from accidents was 233, whilst the quantity of coal raised for each life lost was 103,096, whilst at the close of the next five years there was raised for every life lost 184,459 tons, an improvement of about 60 per cent. Since that period, however, collieries have been sunk to a much lower depth and to far more fiery seams, so that greater risk is now incurred than there was before in raising coal. At the same time, we are still of opinion that explosions can be diminished by ordinary precaution. Frequently have we pointed out that so long as blasting with gunpowder was tolerated in mines that were known to give off gas, so that safety lamps were a necessity, so long would there be explosions in spite of inspection and good management. A similar opinion was expressed by Mr. BURR, and forcibly endorsed by Sir G. ELLIOT, who said that he would pledge his professional opinion that if the use of gunpowder was abolished they would not hear of such great disasters as frequently occurred. This view was also taken by Mr. KNOWLES, who contended that no man should make use of the blasting process where it was unsafe to use a naked light. Here, then, is the strongest concurrent testimony as to the leading cause of explosion in our mines.

But accidents from explosions take place in collieries where no blasting is carried on and where safety-lamps are used, as at the recent occurrence at the Haydock Colliery. Here there is a problem that at present cannot be solved, but is capable of being accounted for in many ways. As Dr. PLAYFAIR observed in the course of the discussion, there were three factors in the production of accidents, two of them being the employers and the employed. Now, much has been said on the part of those who represent the miners as to the duties of owners, managers, and Inspectors, but little or nothing with respect to the employed, and how they can be the main factor in causing an explosion. Where there is no blasting and the best of safety-lamps, as they say was the case at Haydock, the opening of a lamp either accidentally or otherwise, the lighting of a match, or the smoking of tobacco in a place where there was a large quantity of gas would lead to an explosion. Inspection and management could in no way prevent men from recklessly endangering their own and others lives, and where men have been charged with such offences we have found them defended by counsel at the expense of the Association to which they belonged. Yet the representatives of the latter body only last week waited upon Mr. CROSS for the purpose of pointing out the necessity for the more effectual inspection of collieries, as if that were all that was required to ensure the miners against accidents while following an employment that more than any other requires the greatest caution on the part of every man and boy, from the highest to the lowest.

Still blasting is undoubtedly the greatest danger to be guarded against in all fiery mines, and the doing away with which for years past we have strongly advocated. It is true that in giving up powder and bringing the coal down by wedges there would be an increase in the expenditure of getting; but in South Yorkshire, at such mines as the Oaks, Swaithe Main, Edmunds Main, and other collieries where serious explosions had taken place, an arrangement was come to by the owners and workmen, and in those mines no powder is used, whilst the best of safety-lamps are only allowed, and the result is that for some years past the once most fiery district in the kingdom has been about the freest from explosions. In all probability it is in consequence of such precautions that, as Sir G. ELLIOT pointed out the other night, the locale of accidents of a very serious nature veered round from one locality to another, for we all know that after an explosion in a district from fire-damp measures were taken at the other collieries to prevent them from being similarly visited. Forty or fifty years ago we are told such accidents mostly took place in Durham and Northumberland, afterwards they directed their course into South Wales, then into Yorkshire, and more recently into Scotland and Lancashire. A probable reason for some of these accidents has been given by Sir G. ELLIOT, the theory being an entirely new one. He stated that the workings of a pit 500 ft. from the surface were, comparatively speaking, not dangerous at all; from 500 to 1000 or 1100 ft. was the zone of the greatest danger, and when that depth was passed there was still less danger in working the coal. In many instances, such as the Oaks, Lund Hill, Swaithe Main, at the collieries in Lancashire and South Wales, this theory was proved to be correct, and the question arises whether any provisions in addition to those now in force could be introduced for the working of collieries at certain depths, where the seams are known to give off a good deal of fire-damp. The only thing we see that could be at all effectual is the strict prohibition of blasting in all such places, and the rigid enforcement of the safety-lamp. A suggestion was thrown out by Mr. COWEN, during the debate alluded to, that in the case of a coming storm or marked change in the weather, such should be telegraphed to the different collieries, the same as the warning given to the various seaports.

This we do not think would be of any use whatever, for the barometer is now obliged to be kept at all collieries, and managers state that they place very little reliance upon that instrument, for it has been found that where there was a large quantity of gas previous to the barometer falling they also had it previous to its rising. No one we believe, would advocate the general disuse of gunpowder in mines, but only in those that were known to be fiery, for if all coal were to be brought down by hand it would add materially to its cost in getting as well as to the consumer. And here it may be said that the men at many collieries have declined to give up the use of powder even to ensure greater safety for themselves, because by so doing they would receive less remuneration for a certain amount of work. Mr. CROSS spoke in favour of doing away with blasting in mines where gas was known to be given off, and with respect to abolishing it he had consulted the mineowners, and expected before the next session to have their opinions on the subject. He also bore testimony to the efficiency with which the Inspectors of Mines discharged their duties, and felt that after all the great responsibility in the working of collieries must rest with the owners and managers. It was admitted by all the speakers, including Mr. BURR, that the Act of 1872, if fully carried out, went as far as could be desired. Mr. MACDONALD, being satisfied with the statement of the Home Secretary and the discussion he had evoked, withdrew his motion.

We are glad to find that one of the results brought about by the motion of Mr. MACDONALD was the testimony borne by the Home Secretary, as well as by other gentlemen, to the marked ability of the Inspectors of Mines, the great amount of work they got through, and the able manner in which they discharged their duties; yet they have frequently been found fault with by the agents of the miners, who are always on the lookout for anything they can construe into a grievance, although these men, who appear so very desirous of preventing accidents in mines, never think it worth while to advise the miners they represent to be careful whilst following their employment to adhere strictly to the rules, and, so far as they could, see that everybody else working with them did the same. Were this done the probability is that fewer lives would be lost in our coal mines. This also appears to be the opinion of the magistrates acting in our mining districts. Mr. GREENWOOD, Stipendiary Magistrate at Hanley, a few days ago intimated his intention to send all offenders under the Mines Regulation Act who imperil the lives of their fellow-workmen to gaol without the option of a fine. He assigned the large majority of colliery accidents, in which so many lives were lost, to the conduct of careless workmen, and said that such recklessness deserved severe punishment. Most persons connected with our collieries will endorse the views of Mr. GREENWOOD, whilst they will condemn the action of those who wish to fix so much blame on Inspectors of Mines, whose duties are both onerous and laborious, and who are in a position that does not admit of their replying to the charges so frequently brought against them by those who are supported by the working miners of the country, and who are, therefore, unable to find fault with those who employ them.

THE DISAPPOINTMENTS OF AN IRON COMPANY.

The annual meeting of the Rhymney Iron Company was held on Wednesday, when the directors reported progress for the year ending March, 1878, and we regret to say that very disappointing progress it is; in fact, no progress at all. Not many years since the Rhymney Iron Company enjoyed a large measure of prosperity, and was enabled to give its shareholders dividends of 7 or 8 per cent. per annum; but since 1873, when labour difficulties began to afflict South Wales, and when steel began to be substituted for iron, everything has gone wrong. The course of the iron trade since June, 1877, has, the directors observe, been continuously unfavourable. The sale price of iron rails has fallen below 5s. per ton, and the directors add—"The four years which have elapsed since the serious reaction which set in in 1874 are without parallel in the records of the trade." In 1877-78 the company made 40,065 tons of iron, against 47,700 tons in 1876-77; steel was also made in 1877-78 to the extent of 7757 tons, as compared with 917 tons in 1876-77. The steel venture of the Rhymney Company has, however, been thus far attended with unfortunate results. More capital has been raised by the company during the last few months for the express purpose of commencing the manufacture of steel, but the pecuniary result has been nil, and even worse than nil. The great competition which has prevailed for contracts has forced the market price for steel rails down to 5s. 10s. per ton—a rate which has been generally considered low for iron rails. All that the directors can say upon the subject is—"Under these circumstances the company have no reason to regret that their operations in the manufacture of steel have hitherto been limited to a small output." It must be admitted that these words are a very curious commentary upon a policy for the development of which the directors recently issued 6 per cent. debentures to the amount of 88,050*l*. We confess that we cannot see the wisdom of entailing upon the company a fixed charge of upwards of 5000*l*. for the production of a certain article; and then to congratulate the shareholders upon the fact that it has only been made, after all, upon a comparatively small scale, and that the loss has in consequence been comparatively small also.

The fact is that the directors of the Rhymney Iron Company, in

common with the directors of most other iron companies in the country, are almost at their wits' end. They do not know what to do. If they suspend working operations they run the risk of scattering working staffs, and if they continue working operations they can only do so at a loss. Again, if they do not adapt their appliances to the manufacture of steel they run the risk of being left behind in the industrial race; and if they do adapt their appliances for the object in question, they find that when they have done so they have only realised a loss. The directors of the Rhymney Company do not, we presume, give up all hope of the future, since they still propose to issue further 6 per cent. debentures to the amount of 20,000*l*. But when we find the directors observing in the next breath—"Of the prospects of a trade which is influenced by such a variety of circumstances no opinion can be put forward with any confidence. There is, however, an element of encouragement in the hope of the removal of the apprehensions of war which have so long prevailed." These words appear vague, indefinite, and unsubstantial; and in the absence of something more reliable we certainly do think it would be well not to increase the fixed charges of the concern by the issue of more 6 per cent. debentures. However, the company may be liable for some payment from which it cannot honourably escape, and hence the course adopted by the directors in issuing more debenture capital. Even the resource of the coal trade appears to have failed the unfortunate Rhymney Company, for the directors state that they can obtain no profit on the sale of steam coal, and [but very little on house coal.

PYRITES.

Amongst those minerals that the least is heard about, or the nature of which ordinary persons are least acquainted with, are pyrites, yet they are valuable in many ways for chemical purposes, whilst in some stages they are used for fertilising, and in others from them are extracted the more precious metals—gold and silver. Our principal supplies come from Spain and Portugal; our imports average about 500,000 tons a year, of the value of 1,250,000*l*, and some are entered as pyrites and others as sulphur ores. In copper pyrites, after this latter metal is extracted by roasting, the residue known as purple ore is used at several places in blast furnaces for fettling and other purposes, as even then it contains a good deal of metallic iron. But in whatever way the pyrites are used they play a most important part. Sulphuric acid, a most valuable article to the chemist, and the demand for which has increased very much of late years, is obtained from pyrites. Sulphuric acid, we may say, is produced in limited quantities from sulphur itself, and from it hydrochloric acid is made pure and free from arsenic, and extensively supplied to the sugar trade. But the genuine raw product for the manufacture of sulphuric acid is undoubtedly pyrites, and for this purpose it is largely used, although a portion of the sulphur extracted from the refuse left in the manufacture of soda is turned into sulphuric acid, but not so much. The various methods for producing sulphur ore are based on the oxidation of sulphurous compounds, which are contained in the residuum of soda, as the oxidation changes them into soluble polysulphurets and hyposulphites. Hydrochloric acid, which fetches a very high price in the market, is produced by the action of sulphuric acid on salt during the first stage in the process of manufacturing soda. But there is another way in which the imported pyrites of copper, sulphur, and iron are successfully treated and do good service in several ways. At the works of the Tharsis Sulphur and Copper Company, Glasgow, large quantities are utilised. They are first given to the alkali and manure manufacturers, who burn out the sulphur, converting it into sulphuric acid. When this is thoroughly done the residue, consisting principally of peroxide of iron, with copper, which is then operated upon at the works of the company, where there are extensive appliances for the purposes.

The imported pyrites it is known by those engaged in their manipulation contain minute proportions of both gold and silver, and it has been found worth while to extract these metals, infinitesimal as they are, and this is done in a rather simple but at the same time most effectual manner, invented, we believe, by M. CLAUDET, who was connected with an establishment engaged in the extraction of copper from the residues of pyrites, but on a much less scale than the Tharsis Company, who import close upon one-third of the pyrites that come into the kingdom. First of all, we are told, the ore is ground and sifted, and then roasted in a reverberatory furnace at a low temperature, having added to it chloride of sodium, or common salt. It is then placed in a large tub having a double bottom, which forms a filter, where it is frequently washed with a solution of hydrochloric acid. The result is that the sulphate of soda and chloride of copper formed by the roasting are extracted and dissolved, whilst chloride of silver is formed. The washings are then run off into tubs, in which are pieces of iron, when chloride of iron is formed, and the copper precipitated in the metallic state. For the separation of the gold and silver the first three washings are taken, which are found to contain about 95 per cent. of all the silver that is dissolved, and are run into a wooden cistern. The clear liquor is afterwards drawn into another tub, to which a solution of iodide of potassium is added. The mixture is then well stirred, and then allowed to rest for about 48 hours. Clear water is again added, and the same process gone through. At intervals the deposits are collected, and are found to consist chiefly of sulphate of lead, iodide of silver, and salts of copper. After being separated there is silver, a very small portion of gold, lead, copper, oxide of zinc, oxide of iron, &c., showing about 6 per cent. of silver, and gold to the amount of about 1-100th part of the silver. The quantity of silver and gold separated by the process described at the works at Widnes in 1871, from a gross weight of 16,300 tons of roasted ore, was 739 lbs. of silver, 7 lbs. of gold. It will thus be seen that pyrites as a source of gold, silver, copper, iron, sulphur, &c., are far more valuable than many people would think they are, owing to such little attention being drawn to them.

DISCOVERY OF A NEW BRITISH MINERAL.—Mr. C. E. Manby, analytical chemist, has discovered a new mineral in the boulder clay of Furness. From a paper on the subject read before the Barrow Naturalist Field Club, he says he names the new mineral vermicellite, owing to its similarity in many respects to the vermicellite of Pennsylvania, belonging to the mica group. The distinction between the two metals appears to be a great increase of ferric oxide in vermicellite, a decrease of alumina, silica, and water, with the addition of new compounds, titanite and phosphoric acids, lime and soda.

MEASURING AND INDICATING THE PASSAGE OF AIR THROUGH MINES, &c.—Mr. HENRY HALL, of Rainhill, mining engineer, has patented some improvements in measuring, recording, and indicating the passage of air through mines, sewers, and tunnels, and in apparatus therefor. The object of the invention is to provide means and apparatus whereby the amount of air passing through each and every portion, or any desired portion, of a mine, sewer, or tunnel may be readily ascertained at any selected point or place, such as the head or mouth of the sewer or tunnel. For this purpose he employs apparatus or appliances—say, anemometers—for measuring the quantity or speed of air flowing through the mine, sewer, or tunnel, in combination with electric wires, for conveying a record or indication of the motion of such anemometers or measuring apparatus or appliances to one or more points or stations, so that the state of ventilation of any and every portion of the mine, sewer, or tunnel may be readily ascertained by those concerned. Means and apparatus whereby the invention may be carried into effect will now be described, although other arrangements may be employed without departing from the invention. An anemometer of ordinary or convenient construction is placed in each or any passage of each mine, sewer, or tunnel, and one of the moving parts of each anemometer is so fitted or provided with a contact maker and breaker that an electric circuit is alternately made and broken at a speed corresponding to the speed of the anemometer. The records from the said making and breaking of contact are transmitted through the electric wires to the desired point or points, as mentioned, as

REPORT

June 27.
 to visit th
 to avail my
 when legiti
 weighted w
 promoters.
 misprint in
 the report
 Mine seems
 Cliff, with
 Conway is
 Coed, the
 Mawr Pool
 its machine
 should say
 of the distri
 tual metho
 The men
 strike again
 Quarry, nee
 priors hav
 smaller qua
 and to see t
 and Portdin
 No orders f

there indicated on a dial or by the ringing of a bell. Instead of opening and closing circuit each anemometer may cause a bell or other instrument to sound, and the sound may be conveyed to the desired point or points by means of telephones and wires.

REPORT FROM CORNWALL.

June 27.—As was to have been expected, the apparently favourable prospects of the Congress guaranteed, and, indeed, to a certain extent discounted, as they have been by the Salisbury-Shouvaloff memorandum, is causing a decidedly improved tone in the aspect of the share market, and the probability of a considerable rise in our staple metals, undoubtedly renders the present a very promising time for speculation. Moreover, there never was a time when the prospects of improvement in working and economy in production were so great. Not only is the boring-machine in one form or another gradually finding its way into every corner of the county, but the experiments in other directions are rapidly extending. We have alluded to the trial of Husband's Stamps at Carn Brea, and to those of Sholl's at Botallack, and now an effort is being made to improve the use of explosives by experiments conducted at East Pool. All this effort must tell in the long run, and, indeed, much of it is already having a marked influence.

The experiments at Botallack with Sholl's Stamps have been very satisfactory. One of his single head rotary pneumatic stamps (small size) was run at this mine with highly satisfactory results in the presence of the managers, agents, and practical tanners at Botallack, Wheal Owles, and surrounding mines. The stuff selected was the hardest the mine afforded, and slimy in character, and the report of the agent shows that the machine ran 5½ tons of this stuff through No. 35 grates in considerably less than five hours, at a maximum speed of 140 blows per minute, with a 5-in. belt. The larger and direct-acting machines are of the capacity of 1½ ton per hour per head; such must take an exceptionally high position in the tin and gold quartz mining of the future. The absence of all glands, and the few pieces of which they are constructed, reduces wear and tear to a minimum, as well as allows a large quantity of ore to be stamped and dressed in a limited space. There can be no doubt that in a very few years the old gravitation stamp, save in the few instances in which it can be worked by water-power, will become a thing of the past. We have yet to see, however, which of the new rivals will best approve itself to public favour. Both Husband's and Sholl's have shown that they can do excellent work, but now the task will be to decide between them. It is not unlikely that it will be found that both will have their respective places and special uses.

Fresh evidence of the extent of the depression is being supplied weekly, if not daily, and now we hear of a discharge of between 80 and 90 men from Phoenix, where the adventurers, like a good many others, have very naturally become tired of raising large quantities of tin monthly at a heavy loss. The returns, however, are not likely to be greatly lessened, and there is no doubt that as soon as matters improve the mine will again be in full work. Phoenix is a fine mine, and excellently managed, but circumstances have been too strong for it, as they have at South Caradon, but the cloud there we anticipate is of a very temporary character. There is no falling off in the mineral wealth or the prospects of produce in that remarkable mine.

There has been quite a rush of mine accidents of late, fortunately, however, not in all cases of a serious character. Dolcoath, West Bassett, West Seton, and Cook's Kitchen have been the scenes of the casualties. There has been nothing unusual about them, except in one instance, which is very remarkable. A young woman while spalling at West Seton struck a stone with a hole in it. Immediately there was a loud explosion, pieces of the stone flying in all directions, and some striking her in the face. It was first thought she would lose her sight, but fortunately she escaped with a few severe cuts. It is supposed some dynamite was left in the hole in the stone, and that the blow exploded it.

A very important case has just been decided in the Divisional Court of Appeal, in which it has been laid down that a cost-book mining company cannot cause a shareholder who refuses to pay a call to be sued by a creditor of the company, and so recover the amount indirectly. The action related to West Maria and Fortescue Consols. The defendant had been saddled with a call of 6s. per share on winding up the mine on 150 shares which he had relinquished. He refused to pay, and then a plaint was issued by the solicitor of the mine in the name of the plaintiff, an ironmonger, who had supplied the mine with goods, against the defendant. When the case was heard before the judge of the County Court the company were brought in as third parties, and after argument and adjournment his Honour decided that as the company were not incorporated they were not properly before him, and that as it was a question between the plaintiff and defendant he gave judgment for the former. This led to an application to the Court above, and the case was sent down again to be retried. As the point is a very important one, we give the judgment of Mr. Justice Lindley in full. His lordship said—

"The first point to be considered is whether this is an action by a creditor in the real honest sense of the word, or whether it is an action by the company, in the name of the plaintiff, for the purposes of the company. The County Court judge has apparently come to the conclusion that it is not an action by the creditor to assist his own claim, but that it is an action by the company, and then he has apparently given judgment on the supposition that it is a real creditor's action. That cannot be satisfactory. Assuming he is right in coming to the conclusion that it is not a creditor's action, then it appears to me he ought to have treated it as such which it is in reality, and not in form. He ought to have treated it as a collusive action, instituted by the company to put pressure on a shareholder with whom they have a dispute. The proper mode of dealing with that is to stay the action, and say that the creditor has no right to lend himself so as to become a mere instrument for the purpose of settling some dispute. Before the Statutes Act, 1869, this practice of bringing actions in order to enforce calls was common enough, and there was some reason for it then, because, a cost-book company not being incorporated, there was no way of enforcing calls. Therefore when a call was made, and a shareholder would not pay, a creditor was put on the shareholder. That was a gross abuse, for which, at the same time, there was something to be said. Now there is nothing to be said for it, because by the Statutes Act, 1869, an action can be brought by the pursuer for a call made by the company. That being the case, the crooked expedient of putting a creditor on a shareholder has become wholly unjustifiable. I am assuming that the County Court judge came to the conclusion that this was the company's action, and if he did then he ought to have dealt with the action on that principle. He appears not to have done so, so that there has been some miscarriage, and the right way to redress it will be to send the case down for a new trial. As to the question whether a cost-book company can sue and be sued under the Judicature Act, they can sue and be sued. They are not a corporation, but a partnership, and there is no reason why they should not sue and be sued, like any other partnership. They cannot, under the Statutes Act, sue by the pursuer except for calls. The real thing to do in these matters is to look and see whether it is a bona fide creditor's action, in which case the judgment in the present instance is right, or whether it is a collusive action, in which the judgment is obviously wrong."

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

June 27.—I am very much obliged to Mr. Pell for his invitation to visit the Blaen Caelen Mines, which invitation I shall be glad to avail myself of shortly. It is always a sincere pleasure to me when legitimate mining enterprises, especially those not over-weighted with purchase money, answer the expectations of their promoters. Turning to the Llanrwst district there is evidently a misprint in the report from South de Eresby last week. Should not the report say 1½ ton instead of 1½ ton from the shaft? Llanrwst Mine seems to be keeping its machinery fully employed. White Cliff, with excellent dressing machinery, seems idle. The Vale of Conway is not doing much. Pandora is working well. Bettws-y-Coed, the old Pencraig, appears to be opening up promisingly. Coed Mawr Pool is working quietly. D'Eresby Mountain is getting up its machinery, apparently of a simple and inexpensive though, I should say for the larger sized ores, of an effectual kind. The want of the district, as far as appliances are concerned, seems to be effectual methods for the treatment of slime.

The men at the Rhos Slate Quarry on Moel Siabod are out on strike against a proposed reduction of wages. At the Pantdreiniog Quarry, near Bethesda, the men have turned out because the proprietors have closed some unremunerative bargains. Many of the smaller quarries are obliged to discharge half their men. It is quite sad to see the lifelessness of the quays at Portmadoc, Carnarvon, and Porthmadoc—the quays full of slates and the ports with ships. No orders from abroad is the answer to the enquiry as to why this

is. Foreign merchants have been afraid to buy and the shippers to put to sea in the probability of war that has been hanging over us for some time past, consequently the whole production of the quarries is at the disposal of home consumers. This is the secret of the depression in the slate trade, and with the security of peace it will pass away. Your correspondent "H. O." need not be afraid that in any ordinary state of trade the Americans can legitimately compete with us in slates. The large merchants do not buy these slates, but the bargain hunters and the men who are their own architects, builders, and merchants in one. Only the other week a small merchant boasted to me that he had recently bought a lot of 18 x 10 American slates at 8s. 10s. per thousand, and that he had ordered 100,000 more, for, added he, I should have to pay 15s. for Bangor slates. Referring to my list I found that the price of Welsh slate of this size was 7s. 10s. The fact also remains that we exported a large quantity of slates to America last year, and beat the Americans in their own market. I may answer part of your correspondent's enquiry. The average cost of the carriage of slates in Merionethshire and Carnarvonshire from the quarries, f.o.b. ship, is 3s. 6d. From Portmadoc to Liverpool the freight is 6s. To London the cost either by rail or sea may be taken at 11s.

The Coal Trade is quite as firm as it has been of late, and enquiries are being made for gas coals for the ensuing winter. The Welsh people are somewhat particular in their choice of house coals, so that the more expensive Lancashire and Staffordshire coals are bought in most parts of North Wales to the comparative exclusion of home produced coal. This is seen in the great preponderance at all the railway stations of coal wagons from the foregoing counties.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

June 27.—Trade generally in all parts of Derbyshire is still very dull, and a considerable number of men are out of employment. Lead mining goes along slowly, there being only some two or three really good and profitable mines in the county but there is no doubt but what there are plenty of the old works that with capital could be made to pay. But capitalists and speculators have never had their attention drawn to the wealth of lead that is still left in the oldest mining country in the kingdom. Coal mining has long been looked upon as safe and profitable, but this is not the case at the present time, for there are very few large or small concerns that are doing more than paying expenses, whilst many are not even doing that. There has been a considerable falling off in the business doing in house coal not only with the Metropolis but with the Eastern Counties and the West and South of England, and no improvement can be expected for some months to come, for consumers, as a rule, will not fill their cellars in the summer for winter use, although it would be to their advantage to do so. In London coal is now lower in price than it has been for some years, so that if there is any profit at all it goes to the merchants, and not to the colliery owner. Steam coal does not go off so well as might be expected for the time of year. Dulness pervades all branches of the iron trade, and the low price at which pig has to be sold leaves no margin whatever of profit to the makers. At Dronfield, midway between Chesterfield and Sheffield, a good business is being done in Bessemer steel rails, as well as in light malleable castings. The foundries have been working steadily, but at very few indeed can there be said to be anything like activity.

In Sheffield trade is still quiet in most branches, and a considerable number of workmen are still only partially employed. Some few orders have been received from our colonies, whilst America is taking more freely of our products. For the best class of table and penknives there has been a tolerably fair demand, but there has been no improvement with respect to inferior qualities. Crucible steel is still in but moderate request, and some of the houses are pushing with more than usual energy. Bessemer rail makers have plenty to do, but the prices rule very low, most orders that are now given being under 6s. per ton delivery. Not much is doing in ordinary iron rails, seeing that the price between them and steel is so trifling when considered in connection with their relative durability. In ship-plates rather less is being done, and there has been a slight drop in the prices. The mills employed on heavy armour-plates have been kept moderately going clearing out old orders, for it is not likely that our own Government will make use of them, seeing that steel will be adopted, as it gives the maximum of resistance with the minimum of weight. In the town and district the foundries have been kept fairly going in light work in particular, but the engine works and machine shops are far from busy.

Throughout the West Riding colliery owners complain of the stagnation of trade, and the exceedingly low price at which coal has to be sold. Profit is entirely out of the question, and he may be considered a lucky proprietor that is able to work his colliery without suffering loss. This state of things cannot last much longer, and there is very little doubt but what there will be before long a proposal for a reduction of wages, more especially in South Yorkshire. At the Dodworth Silkstone Colliery, near Barnsley, the men are still on strike, and a large police force has to be kept near to the works to protect the men. The Unionists have, it is said, applied to be taken on, but the managing director has stated that he will not discharge any of the non-Unionists to make room for them.

COLLIERY MANAGERS' EXAMINATION IN LEEDS.—The annual local examination, under the Mines Regulation Act, of candidates for certificates of competency as colliery managers, took place at the Yorkshire College, Leeds, on Tuesday. The number of candidates admitted as eligible for examination was 15—the same as last year—and the district represented was that of Yorkshire and Lincolnshire, which is under the inspection of Mr. F. N. Wardell. Mr. J. R. Jeffery (Bradford) attended as secretary of the board, and the examiners, as on former occasions, were Messrs. Embleton, Evans, and Carrington.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

June 27.—A somewhat better business is doing in the iron trade. Consumers here and there are ordering for future delivery. This tendency is more marked in the pig than in the finished iron branch, and some users of the raw metal are prepared to place contracts, based upon the ruling quotations for delivery at a longer period hence than blast-furnace proprietors are inclined to accept. As to the finished iron trade, the sheet business, which has hitherto kept up remarkably well, is beginning to get slightly quieter. Prices of sheets have fallen very low. Coal is dull. The summer weather is limiting the enquiries for household sorts, and around Cannock Chase and Brownhills, where this class of fuel is mined, much distress exists. Indeed, the inauguration of a relief fund thereabouts is contemplated. Several large collieries in the district are working only three days a week, and the men at what is locally known as "the Brownhills field" are likely to be put on half-time. This depression is due in much part to the large quantities of coal which the collieries of Derbyshire and Nottingham are sending into the Birmingham and surrounding markets.

The question as to what prices are likely to be declared at the ensuing quarterly meetings is being earnestly debated. To the surprise of the market there were on the Exchanges this week influential ironmasters who declared themselves favourable to a drop in marked iron, a reduction, indeed, to such an extent that has been unusual for a long time past. It is not, therefore, unlikely that the present quotation of 8s. 10s. will be sensibly reduced.

Some months ago leading colliery proprietors in the Cannock Chase district gave to their men the stipulated six months' notice to terminate the "Birmingham agreement," or sliding scale. Now the majority of the miners have themselves given a like notice to their employers. It is not assumed that a reduction in wages will immediately follow upon the expiration of the notices, but, of course, the masters will be guided by the state of the market at that time.

The Mines Drainage Commissioners announce that, by virtue of the powers conferred upon them by the Acts of 1873 and 1878, they are prepared to receive loans on bonds, for three, five, or seven years, chargeable on the Mines Drainage rates of the Tipton district, and bearing interest at the rate of 5 per cent. per annum, payable half-

yearly by coupons, which will be attached to the bonds. The annual rate chargeable with the repayment of principal and interest is estimated to produce from 18,000l. to 23,000l.—The Arbitrators under the same Act have arranged for a public sitting, when they will propose to make a draft Mines Drainage award for the Kingswinford district. They estimate that a rate will be required of 1d. per ton on all minerals raised in the district, except in that portion known as the Bromley or Brockmoor Pound, which is flooded. In this area the maximum rates will be 3d. on fire-clay and limestone, and 5d. on ironstone, coal, and slack. Mineowners and occupiers interested in the district are entitled to attend the meeting, and state their objections to the levying.

On the local Stock Exchange the original shares of the Sandwell Colliery Company have lately sold at 4 prem., and the new issue of the same concern at 2½ prem. The Spon Lane Colliery property has changed hands at 6½ dis. The Willingsworth Colliery 10s. shares sell at 5½. Holders in the Cannock and Huntington Colliery would accept 3s. for the 20s. (12s. paid) shares; 10 dis. is being offered for the Hamstead Colliery shares, but sellers will not enter the market with this figure before them. The John Bagnall Iron Company's shares have recently sold for 1½.

The Walsall poor law guardians have received a reply from the local Government Board as to their right to give relief in the stone yard to persons who refused to take the places of miners who had struck work. The authorities write that a man who has been offered and could take employment at wages adequate to the maintenance of himself and his family could not be considered destitute. Yet it was doubtful whether it would be expedient to take proceedings for neglect of family against married men who refused to take work under the circumstances the guardians had set forth.

The quarterly meeting of the newly-formed No. 2 district of the South Staffordshire Protective Association of the National Federation of Enginemen was held on Saturday, at Wednesbury. Amongst the resolutions passed was one to the effect that in the opinion of the meeting no person should be allowed to take charge of either beam engine or boilers until he had been examined by a properly constituted board of examiners, and had received a certificate of competency.

The North Staffordshire Coal and Iron Trades are without change. They remain dull, with buyers waiting to see what the Quarterly Meeting will bring forth.

TRADE OF THE TYNE AND WEAR.

June 26.—It is difficult to find any encouraging feature in the Coal and Iron Trades at present; indeed, many are inclined to take gloomy views of the future, but there is good ground for supposing that the turn affairs have now taken in the East will have a beneficial effect shortly; at any rate, if peace is really assured an improved trade is expected. Very few collieries are employed at or nearly full time. The best gas coal works are well employed, and as those coals are produced at a low cost, and freights are very low, they can be sold at a price which defies competition. The shipments of these coals to home ports have always been large, and the shipments to foreign ports have increased of late. Considerable shipments are now made to American ports, large vessels taking cargoes at freights about equal to freights to London. Of course these vessels are engaged to bring grain from the western continent, and the coals are taken as ballast. Some of the best steam coal works are fairly employed. At Cambos, one of the best works in Northumberland, 50 keels of the best screened coals are sent out per day. The demand for house coals is limited, and works on both rivers are only employed three days per week. The large ironwork firm of Bolckow and Vaughan have decided to stop one of their coal works, employing 400 hands, and other works are likely to be stopped. The shipments of coals at Tyne Dock last week reached 30,000 chaldrons; this is rather in excess of the weekly shipments of May and early June. The shipments on the Tyne and Wear are increasing rapidly.

The decision in the case of the East Hetton Collieries in Durham, respecting the firing of shots in the long-wall workings, is certainly an important one; but some writers on the subject appear to attach undue importance to the case, when they assume that the decision will affect a number of collieries working the same seam under similar circumstances. It is not likely that this will be the case; the managers at the various works will pursue the course they deem safe, unless they are called upon by the Inspector in a similar manner. The decision in this case can scarcely be considered as seriously affecting any other work, as the circumstances of no two mines are precisely similar.

The annual meeting of the Northumberland Miners' Union was held on Saturday. There were several important changes proposed, but on a division most of those changes were negatived. There was also a contest for the office of president, but ultimately the former principal officers were re-elected; and, on the whole, the result shows that the majority of the members have confidence in the leading officials. Some of the bye laws passed show that at the present time there are considerable numbers of miners who are not now members of the Union; this is also the case in Durham, where a considerable number of men refuse or are not able to contribute to the funds, owing to the long depression of trade.

There has been an improved demand for iron during the past week, that is pig-iron, and the demand for plates continues good. The plate-mills formerly worked by Cook and Hillman, Gateshead, which were stopped some time ago, have been taken by a good local firm, and they will shortly be restarted. The improvement in the chemical trade last week has been fully maintained, and prices are higher. The demand for soda crystals has been especially good, and the price has advanced to 3s. 2s. 6d.

At a meeting of the Mining Association of Great Britain held in London on Wednesday, the following resolutions were proposed by Mr. T. W. Bunning, of Newcastle, and seconded by Mr. R. Heath, M.P.:—1. That it is undesirable and dangerous to extend the present law.—2. That if any alteration be made in the law that it should not render innocent persons liable.—3. That before any alteration is made a commission be appointed to ascertain how far the object sought to be effected can be done by a system of assurance, such as at present exists on the Continent and in many places in England. A deputation appointed by the meeting afterwards waited upon the Attorney-General and urged their views. In reply, Sir John Hocker declined to make any promise, but said he would carefully consider the matter.

At Middlesbrough on Tuesday the market was rather quiet. There has been more enquiry for pig-iron, and makers are very firm at the full quotations of last week. The general market figure is 43s. No. 1, 39s. No. 3, and 38s. No. 4 forge, less commission, and merchants give this rate rather more freely than they did last week. Merchants who have a good extent of orders on their books are asking 39s. 6d. No. 3, and some 40s., but practically they are out of the market at the rates. There are hopes entertained that the stocks at the end of the month will again show another marked reduction, as iron has been going off pretty freely for shipment. Above 14,000 tons have been sent to Scotland from the Tees within the last fortnight, and though the inland deliveries have fallen off, compared with what they were in the early part of the month, the local demand has been well maintained. There is some talk amongst the merchants of establishing a daily warrant market similar to that at Glasgow. The ironfounders are improving with respect to work in most cases, and there are additional enquiries, chiefly for railway chairs and pipes, as the general casting trade has been quiet. There is no change in the plate trade. Some of the firms in the district are getting rather short of orders, but prices have not changed. About 6s. 2s. 6d. is the rate, except for small quantities, which are charged higher. Boiler plates, 7s. 2s. 6d. to 7s. 5s.; sheets, 7s. 15s. to 8s.; angles, 6s. 12s. 6d. There is a dull sale in bars, and prices are unchanged.

THE MANUFACTURED IRON TRADE.—The quarter's return of the average net selling price of manufactured iron for the purpose of reducing wages has been made by Mr. Waterhouse, accountant to the Arbitration Board of the Northern Iron Trade. The return gives for plates, rails, and angles a net average price of 6s. 8s. 11d., 6s. 8d.,

below the preceding quarter. The decay of the iron rail trade is manifest, being only 1-10th the former production. Plates have largely increased, and the total tonnage of iron is 115,000 tons, an increase of 17,000 tons for the quarter, showing the improvement in the trade.

REPORT FROM THE FOREST OF DEAN.

June 27.—Our last report did not put the proposed alteration of railway lines in a way that would enable readers out of the district to see exactly how the junction of the Hereford line will be effected with the South Wales line. We will, therefore, briefly supply the lack. We remark, then, that the Bullo branch line runs up to Bilson weighing machine, and from what is designated Bilson Yard for trucks, &c.; just above weighing machine a branch turns off to the right up to the Whimsey, near to the Duck Pit and Old Regulator Colliery, where Edge Hill or Dowlais Iron Mines has a station for transferring the iron ore from their tramcars to the railway trucks to be taken to Wales for smelting. Now, the Whimsey and the Mitchell line when finished will effect a junction of its line with the Bullo line; but as the Bullo line does not connect with the Severn Bridge, the survey we directed attention to in our last, as having been just effected from Shakenmole to Deadman's Cross, is for a short piece (or link) of line to form a junction with the Mid Forest line, and going down that line as far as Pileon Green and Blakney Woodside, a deviation is there proposed, to cross via Nibley and Etloe, to a junction with the bridge now in course of construction. There is also proposed the short short run from Awe Junction to the bridge, but whether both will be constructed remains to be seen. They appear to be both necessary to the Great Western system, but the first named is essential to complete the junction of the through line from the Hereford and Gloucester via Whimsey, Bilson, Shakenmole, Deadman's Cross, &c., with the Severn Bridge.

The reader will now have little difficulty in understanding the nature and extent of the alterations proposed. They will all be advantageous to the district, as well as to the travelling public. The completion of the Whimsey and Mitchell line will be taken in hand as soon as contracts can be effected. Several contractors have gone over the line since our last, and those competing have sent in their tenders, which were expected to be opened at this week's meeting of directors (held on Tuesday or Wednesday); but the decision of acceptance is not expected for a few days, as it may be desirable to make a few enquiries as to parties before finally deciding who shall have the contract or contracts, as there will be the building of stations and other things, besides the finishing of the road. We have been informed that the Great Western Company made an offer for the Severn and Wye line, but which was declined. The Great Western people consider that the Severn and Wye Company's system will be hemmed in by their lines, so that the little "plucky" company will have little chance of success, as it has no outlet—no through system. Possibly the great company may discover some day that this impression was founded in mistake and miscalculation. We could say more, but do not choose to do so under present circumstances.

Mr. Chivers is pushing on his new tin-plate works, and some predict their opening by next New Year's day, but for ourselves we cannot see how that can be realised. We should consider it a good success and very creditable to all concerned should the whole erections, including buildings and machinery, be well completed by next spring or summer. The Wigpool Company has just opened a new tramway to Mitchell road Station. Trade, however, all over the Forest is in a very depressed condition. Yet the leading local paper in its trade report to-day states that at the Forest Vale forges work is in full swing, and has been since the Whitsuntide holidays, when the truth is the men have done next to nothing since that holiday for want of orders. And there is in the same paper in to-day's issue a note from the Messrs. Crawshaw contradicting its last week's report. We wish good news to be true, but very little of it is so affecting trade. The local industries are down, and when they will rise it is difficult to say—perhaps impossible. Coal is selling now as low as 8s. per ton the best, and rubble can be had at 5s. per ton, and lime coal as low as 3s. per ton. The Clifton improvements are proceeding, and when the main thoroughfare across the hill-side through the town from one turnpike to the other is completed (if it ever will be) the difference in appearance and reality will be immense.

So many canards were started about Messrs. Brain's lawsuit, in reference to the inflow of water to Truflag Colliery, that parties became bamboozled. It was, however, decided in their favour several weeks since, but the award yet remains to be paid, or Speculation Colliery turned over to them.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

June 27.—The Rhymney Iron Company annual meeting was held yesterday, in London, but the proceedings were private. They could certainly not be of a very congratulatory nature, but the report for the year ending March 30 is by no means of a satisfactory character. Like all other ironmaking companies the depression in trade has had its effect on the year's transactions. The loss on the year's trading amounts to over 9000*l.*, which sum includes 4150*l.* interest on the debentures. The production of iron has slightly decreased during the year, while that of steel has risen from 917 to 7757 tons—a proof of the greater demand for the latter commodity. For three-quarters of the year, state the directors, "the works were kept in nearly full operation with orders for iron, but in the last quarter the demand was so small, and the sale price had fallen to so low a point, that the directors considered it the most prudent policy to stop the working of the forges and of the principal portion of the mills." They also point out that the sale price of iron rails had fallen to below 5*l.* per ton, and quotations for steel rails to 5*l.* 10*s.* per ton. They can obtain no profit on steam coals, and very little on house qualities. At the same time, they are fully prepared for any revival of trade which may occur. They add that there is an element of encouragement in the hope of the removal of the apprehensions of war which have so long prevailed.

An extraordinary meeting of the Dynevor, Duffryn, and Neath Abbey United Collieries Company (Limited) shareholders has been held in London, when a resolution for winding up the company voluntarily was agreed to. This step has been rendered necessary by proceedings taken in Chancery by two of the debenture holders for a compulsory winding up. The Vice-Chancellor adjourned the question to give the shareholders and debenture holders time to enter into an arrangement for a reconstruction and reorganisation of the company. It is proposed to charge a certain amount on the company, and convert the debenture into preference stock.

Some weeks ago it will be remembered that a number of colliers who were then on strike were charged at the Pentre Police Court with intimidating new hands at the Blaenclydach Colliery. The old hands had since returned to work, and 16 of them were this week fined in the nominal penalty of 1*s.* and costs. An adjourned meeting of colliery delegates for this district has been held at Aberdare, when a long discussion took place as to whether it was desirable to give the house coal men further representation on the Conciliation Board. No change was, however, made. D. Williams, engineer at the Tynybedw Colliery, has been charged at the Pentre Police Court with a breach of certain special colliery rules. Defendant had charge of the entrance to the colliery and permitted a man named Jones to accompany the stoker to examine a pump 50 yards below the surface. Jones fell into the shaft and lost his life. Defendant was fined 40*s.* and costs, a heavy penalty not being pressed for. A collier named Lewis Jones has been fined 10*s.* and costs for taking matches into the Celynon Pit, Abercarn. How hard it seems to teach men to set some value on their own and other's lives. Another victim has succumbed to injuries received at the explosion of gas on board the steam ship Chrysolite, at Newport. The captain, Griffith Jones, died at the infirmary on Saturday. The Board of Trade has now abandoned the idea of making an official enquiry.

Although there is no doubt that more work is on hand at some of the local establishments, still the Iron Trade remains in a most depressed condition. With prices improved a little the masters might carry on operations with some slight profit, a thing which they can scarcely be doing at the present time. The figures quoted in the report of the Rhymney Company show to what a low ebb prices have sunk; and there certainly seems not the slightest hope of an improvement; slackness of demand, general commercial depression, foreign competition, all these militate against improved prospects. One thing is to be said, however, that the men do not fight now against reasonable reductions in wages. The demand for rails is not quite so good. Bars are quiet, but at a few of the works stocks of pigs are not quite so large. Three mills are now fully employed at Rhymney—two with steel and one with iron rails—which is a decided improvement. The Uxside Engineering Company, at Newport, have just completed a good order for locomotives and other machinery for India, which will shortly be shipped to Kurrachee. The Tin-Plate Trade is comparatively unchanged. The American demand is reported as a little better, but prices are unsatisfactory. At several of the works reductions in wages have been enforced *inter alia* at Pontnewynydd.

The Coal industry cannot be said to present any new or more satisfactory feature. In order to avoid breaking old connections orders have, doubtless, often to be carried out at a positive loss. The demand for steam coals does not appear to be quite so good, but shipments are maintained up to about the usual standard. Freights

are still very unsatisfactory. The house coal department continues very quiet. Patent fuel is difficult to dispose of.

During the Board of Trade enquiry into the explosion on the steamer Sardinian, Mr. Patterson, C.E., of Warrington, said that the coal on board the Sardinian was characterised by friability and remarkable freedom from sulphur. If the hatches were kept closed the gas evolved would not pass off. If the coal was loaded in a damp state—and the evidence showed that some rain fell during the loading—the formation of gas would be facilitated, because the temperature would be increased. He estimated that in the case of the Sardinian the coal would give off as a maximum 1780 ft. of gas to 17,000 ft. of space, or 1 in 10, which would be a highly explosive mixture. In reply to Mr. Rothery, the witness stated that he considered the coal to be perfectly safe if there were surface ventilation. But, assuming that there was no ventilation, the explosion undoubtedly came from want of it. He disagreed with the recommendation of the Royal Commission that ventilation should be effected by means of two shafts, the cowls of which should be adjusted, one for the admission of fresh air and the other for the exit of the foul air. He held that to have a perfect ventilation it was necessary to establish a vacuum in one shaft. The admission of atmospheric air, unaccompanied by the emission of the foul gas, would be a danger, inasmuch as an explosive mixture would be caused.

Mr. Thomas Wales, Her Majesty's Inspector of Mines for South Wales, stated that Nixon and Crawshaw's coals belonged to the same vein, and were considered to be the best coals shipped from Cardiff. They gave off a good deal of inflammable gas in the pit, and gas would continue to be evolved after they reached the surface. They were used by shipowners because of their great firing power. With regard to the ventilation of coal ships, he thought there should be a system of artificial ventilation over the surface of the coal, and not merely two shafts through which the ingress of fresh air and the egress of gas should be left to act mechanically. The gas should be forced up the egress shaft. In answer to Mr. G. Hill, Mr. Wales said he believed that in the case of the Sardinian an explosive quantity of gas might be given off after the coal had been brought to Birkenhead and thence shipped on board, when the hatches had been on for 24 hours. The motion of the vessel would not produce draught enough to clear the hold of gas. Mr. Patterson (recalled) agreed with the last statement.

Mr. Thomas Cadman, Inspector of mines for Monmouthshire and the south-western district, said the Ebbw Vale Mine was in his district. He thought the Ebbw Vale coal would still give off gas after having been got a week, and ventilation would still be required. He thought it quite necessary that so large a quantity as 400 tons of this coal when placed on board a vessel should be ventilated. Two cowls, one fore and one aft, would be sufficient to ventilate when the vessel was going through the water.

CHAPEL HOUSE COLLIERY.

The report of the confirmatory meeting of this company, which appears in another column, is satisfactory evidence of the harmony with which the directors and shareholders work together and support each other in their endeavours to promote the prosperity of the company and to secure the certainty of its future prospects. It has hitherto been, and we fully believe it will continue to be, one of the few companies in which the future has been kept well in view, and with such a future as the Chapel House Company has in store the directors have, we think, acted very wisely in refraining from following the more ordinary rule of dividing all their present profits at the risk of being hampered in time to come. The great object which has been aimed at is to develop the property in such a way as to secure the greatest possible advantages which can be derived from it. With this view the company has since its commencement sunk two large shafts, and is now continuing them so as to open up all the valuable seams of coal on the property; it has constructed a vast reservoir, which renders it entirely independent of those occasional droughts which so seriously interfere with the working of steam machinery; it has entirely replaced a set of old-fashioned boilers, which involved a great consumption of fuel, and has substituted for them six first-class Cornish boilers, which will effect a considerable saving of fuel, and will supply steam to all the engines on the colliery; additional railway sidings have been laid down to facilitate the dispatch of coal to the docks at Liverpool; and last, but by no means least, two splendid double-cylinder horizontal engines, with suitable engine-houses, have been erected for winding purposes. In fact, the improvements are such that no finer plant can be found at any colliery in the kingdom. And this has all been done at a cost of time and money which, considering the magnitude of the work, is marvellously small.

The result of this work will be that whereas the company has hitherto been able to raise only some 300 tons per day, a daily output of 1000 or more tons of coal can now be easily maintained. The company has made good profits in the past, while others in the same line of business have been continually losing money; and we think, therefore, that the Chairman was well justified in recently congratulating the shareholders upon the time gone as well as on the prospects of the time to come.

Indeed, the Chapel House Colliery stands out prominently as an example of what may be done by careful, prudent, and energetic management, and we are pleased to be able to believe that the care, the energy, and the prudence which has done so much in the past will continue to redound to the credit of those in whom the management is vested, and to the profit and prosperity of the shareholders.

APPARATUS FOR TRANSMITTING POWER.

Mr. D. MILLS, of Newfield, Gloucester, and New Jersey, United States of America, mechanical engineer, has patented some improvements in apparatus or means for transmitting power, applicable also to the raising, lowering, moving, or transporting of heavy bodies. [A communication from Mr. John T. Hawkins, of Salisbury, Vermont, U.S.]—The invention relates to a peculiar construction of driving belts, and of pulleys to be used therewith, for transmitting power from one shaft to another, also to a peculiar construction of teeth or studs and projections or recesses to be applied to such belts and pulleys respectively, by which the absorption or loss of power arising from the friction or sliding of one tooth or stud along the side of the other is obviated. According to one part of this invention it is proposed to employ endless gearing, consisting of teeth or studs secured by rivets, bolts, or otherwise, to a belt consisting of one continuous strip, or of two or more strips, of metal or other suitable flexible material without hinged joints and that will not stretch, preference being given to metal strips of steel, hard rolled brass, phosphor bronze, or sheet-iron, made sufficiently thin and being so tempered as to conform to the curves of the pulleys without taking a permanent set. The strips when in lengths, in lieu of being flat, may be curved to about a medium between the curves of the pulleys and a straight line. In order to obtain greater and more complete flexibility in the belt at the parts where the teeth are secured, the surfaces of the said teeth next to the belt are more or less bevelled or chamfered in proportion to the size of such teeth, thereby allowing freedom for the belt or the series of strips composing the same to conform more accurately to the curve of the pulley than would be the case if the base of the tooth were entirely flat. He prefers to make the teeth on the belt of leather, raw hide, wood, or similar material which will work without jarring noise, but he does not confine himself to any particular material.

The pulleys to be used with this system of endless gearing are also provided on their peripheries with projections or hollows corresponding to and gearing accurately with those on the belt. The said belts may in some cases be composed of a number of lengths of material disposed side by side, edge to edge, such strips breaking joint, and being, by preference, rounded on the edges to obviate the tendency to fracture, and being also connected either by transverse pieces constituting in themselves the gear teeth, or connected by transverse thin metal strips, and having the said gear teeth or studs secured to the longitudinal strips. When transverse pieces are used for the teeth he sometimes tapers them from end to end in alternate directions, and have corresponding tapered teeth or recesses on the pulley, thereby preventing the lateral displacement of the belt. In order to avoid all friction resulting from the sliding or rubbing together of the sides of the aforesaid teeth or studs, and projections or recesses, it is further proposed according to this invention to employ teeth, studs, projections, or hollows of such a contour on their acting sides that they shall neither roll nor slide against each other when coming into gear. Mr. Mills makes the sides of the said teeth, projections, or recesses, on the pulley and belt either curved or flat; and when curved, he prefers that the said curve should form an arc of an involute, and be such that a tangent to any part of the curve of their sides shall make a less angle with a tangent to the periphery of the pulley at the origin of the involute than does the tangent to the involute at the point of intersection of the top of the tooth. If their sides be flat or straight, then their

inclination should, by preference, make a less angle with aforesaid tangent to the periphery of the pulley than does the aforesaid tangent to the involute. These angles vary of course for different diameters of pulleys, and the teeth may either consist of frustrums of cones, described as above, or of ribs or projections extending across the belt or pulley. The herein before described endless involute gearing is also obviously applicable to the raising, lowering, moving, or transporting of heavy bodies. Mr. Mills is aware that endless pitch chains or hinged drivers have been used, also thin flexible metallic continuous belts made from rolled wire or rods, and having teeth made out of the same material and in one therewith, by rolling, and therefore he does not claim any such arrangement or combination of driver; moreover, the teeth so formed out of the solid material interfere with the flexibility of the belt, and render it liable to break off at the angles of the teeth, whereas in the improved construction herein before described a much greater flexibility and durability of belt is ensured.

SELF-PROPELLING WINDING AND PORTABLE ENGINES.

Mr. J. C. WILLSHER, of Gracechurch-street, engineer, has patented some improvements in self-propelling winding and portable engines. The invention relates to improvements in portable and other engines, the main objects being to simplify and cheapen their construction and to increase their efficiency. He also proposes to put out of sight to a great extent the moving mechanism, so as to remove as far as possible the objection raised to the use of locomotives on public highways. The invention relates, firstly, to the arranging of the crank shaft and other moving parts of the engine below the barrel of the boiler, and at the same time avoiding the necessity for passing any bolts or screws into the water or steam space of the boiler. The steam-cylinder is bolted to a bracket plate, which plate is rivetted to the under side of the barrel of the boiler. Other plates are rivetted to the boiler barrel, and on either side of these plates he bolts side plates to carry the crank shaft, counter shaft, and other gear. By these means he effects the attachment of the entire engine and traction gear to the boiler without any bolting into the boiler, and also places the crank shaft and cylinder near the coldest part of the boiler, so that there is in practice comparatively no expansion and contraction as compared with the engines situated on the top of the fire-box and barrel. The bracket plates serve also as a protection or housing for the engine, and for a semi-portable or winding engine secure the advantages claimed for the well known Robey engine—independence of the boiler without the expense and weight of an independent frame or side girder. In order to carry traction engines, steam road rollers, and other locomotives upon springs he supports the front carriage or locking gear upon a centre pivot to which the spring is attached, or a spiral spring or buffers of india-rubber can be placed around the centre down bolt or vertical shaft, and for the driving wheels of traction or locomotive engines; or for those wheels which require to be retained parallel he affixes their axle arms or axle boxes (which in some cases are carried on springs) to links or radius rods working in bearings affixed to the side plates. In some cases he would attach the radius links direct to the cylinder, as in common locomotives when gearing is not used. The links or radius rods will lie at or nearly at right angles to the line of motion of the bearing springs. The crank axle he mounts in bearings set in the centres of the arms or links upon which the main driving wheels revolve. By making the crank shaft concentric with the travelling wheels, the fly wheel or pulley may be caused to revolve within the periphery of the adjacent travelling wheel. This enables him to save space and effectively enclose the fly-wheel from sight, and remove a serious objection against the use of engines on highways. These links will receive the thrust of the piston and maintain the crank shaft in its proper position. The advantage of mounting the axle boxes or arms in radius rods or links is that the driving gear is maintained in its correct pitch line; or with semi-portable or locomotives that the thrust is carried back to the cylinder.

In hauling engines Mr. Willsheer proposes to pass through the fulcrum pins of the links (which pins are made hollow for the purpose) a countershaft which carries speed wheels and other gearing for transmitting motion to the driving wheels and the hauling drums. This countershaft he fits with two spur wheels at different pitch and brings them into gear with pinions of different pitch mounted loosely on the crank shaft and capable of being thrown alternately into action by means of a sliding clutch. By this arrangement he attains two speeds for the drums of winding or steam cultivating engines, a great desideratum in the practical working, as more power can be applied to overcome stiff work, or, on the other hand, upon light work speed can be increased, which will reduce wear and tear on the engine. By this arrangement the same double speeds and same intermediate shaft can be made common both to the winding drum or drums and to the traction gear of steam cultivating engines, whereby the number of parts is much reduced and simplified. In connection with all engines for steam cultivating, where a winding drum is used round the barrel of the boiler, or where the winding drum is carried upon friction rollers, he so arranges the driving pinion that the strain from the pull of the rope is taken by the pinion and practically taken off the friction rollers, and consequently off the boiler. This result he attains by bringing the pinion into contact with the drum at the point where the rope enters the drum, and thus ensures that the teeth shall take the direct strain instead of transmitting that strain through a part of the circumference of the drum.

In constructing steam road rollers and steam road roller wheels, he forms them so as to receive and retain water as ballast for the purpose of increasing the rolling capacity of such rollers, and for other self-propelling engines forms the wheels so as to hold water and act as auxiliary tenders, and enable engines to travel a greater distance without a fresh supply of water, by which means he obtains the weight as a "rolling load" and not as a load to be carried. When applying a crane to the engine, instead of using additional gearing, as is customary for working the lifting chain, he leads the chain by guide pulleys down to a winding-on drum on the counter-shaft before mentioned, and fit thereto a clutch and brake apparatus. In order to increase the efficiency of the boiler he constructs the crown of the fire-box at a lower level than the top row of tubes, by which means one or more rows of tubes are above the level of the crown. This arrangement allows of a large variation in the water level without risk of the crown becoming over heated. Any number of the upper tubes is attached in the ordinary way through the crown by being bent over or connected by elbows. He prefers to have these tubes come through the crown in the front part of the fire-box, or that part furthest from the ordinary tube plate, as the distribution of the gases of combustion is thereby better effected. He also proposes to shut off the upper or any of the tubes from the fire-box, and thereby prevent the heat from passing through them for the purpose either of reducing the amount of heating surface, or preventing the top tubes from being burnt when short of water. This may be effected by the use of fire-brick dampers, pressing them at pleasure against the tube ends.

Another improvement which Mr. Willsheer proposes in connection with locomotive and portable engines is to provide in place of the ordinary fixed fire-bars an endless chain of fire-bars, which will serve to carry the fuel into the fire-box and also to deposit the ash in the ash-pit. This endless chain of fire-bars is particularly applicable where straw is burned as the fuel. In such case he employs a series of arms mounted on one or more rock shafts, which arms are caused to rise and fall between the bars of the grate or above the grate, and thereby to stir the fuel and retard at pleasure the carrying forward of the fuel. The fuel opening in the fire-box can be fitted with an inclined trough to lead the fuel to the travelling grate, which by preference has a rough surface, the better to catch hold of and draw in the straw, thus making the feed automatic. A jet of exhaust steam can impinge upon the travelling grate, or water can be used in the bottom of the ash-pan to quench any live ash. In order to support the fore carriage and locking gear of traction engines it is usual to carry the barrel plate of the boiler forward. In doing this he now proposes to avail himself of these plates and to form between them a tank which can be used for a condenser, or to carry fuel water, or to exhaust into or for a feed-water heater.

IN THE MATTER OF THE COMPANIES ACTS, 1862, 1867, AND 1877,
AND IN THE MATTER OF THE PATENT TUNNELLING AND
MINING MACHINE COMPANY (LIMITED).

NOTICE IS HEREBY GIVEN, that a PETITION for the
WINDING-UP OF THE ABOVE-NAMED COMPANY by Her Majesty's
High Court of Justice was, on the 24th day of June, 1878, presented to the Master
of the Rolls by CHARLES JAMES ABBOTT, of No. 8, New Inn, Strand, in the
County of Middlesex, a shareholder and creditor of the said company, and that
the said PETITION is directed to be heard before the Master of the Rolls on the
Saturday, the 6th day of July, 1878, and that any creditor or contributory of the
said company desirous to oppose the making of an order for the winding-up of
the said company under the above Acts should appear at the time of hearing by
the said company under the above Acts should appear at the time of hearing by
himself, or his counsel, or that purpose, and a copy of the petition will be fur-
nished to any creditor or contributory of the said company requiring the same by
the undersigned on payment of the regulated charge for the same.

KEENE AND MARLAND, 32, Mark Lane, London, E.C.
(Solicitors for the Petitioner).

Dated the 25th day of June, 1878.

THE ALMADA AND TIRITO CONSOLIDATED SILVER
MINING COMPANY (LIMITED).

Notice is hereby given, that the SIXTEENTH HALF-YEARLY GENERAL
MEETING of the above company will be HELD at 47, Finsbury Circus, London,
E.C., on WEDNESDAY, the 3rd day of July, 1878, at Twelve o'clock precisely,
for the purpose of receiving reports from the directors and manager, and trans-
acting the ordinary business of the company. The Register of Transfers will be
closed from the 19th June instant to the 3rd July next, both inclusive.

By order of the Board,
H. G. DENNIS, Secretary.

47, Finsbury Circus, E.C., 19th June, 1878.

THE RICHMOND CONSOLIDATED MINING COMPANY
(LIMITED).

Notice is hereby given, that the ORDINARY and EXTRAORDINARY
GENERAL MEETING of the shareholders of the Richmond Consolidated
Mining Company (Limited), held on Tuesday, the 18th day of June last, were
then ADJOURNED TO TUESDAY, the 2nd day of July next, when such ad-
journd meetings will be held at the City Terminus Hotel, Cannon Street, Lon-
don, at the adjourned Extraordinary General Meeting at One o'clock in the after-
noon, and at the adjourned Ordinary General Meeting at half-past One o'clock
in the afternoon, or as soon thereafter as the business of the said adjourned Extra-
ordinary General Meeting shall be concluded. The business of such meetings
respectively will consist only of the business left unfinished at the meetings at
which the before-mentioned adjournments took place.

By order of the Board,
HUBERT AKERS, Secretary pro tem.

44, Coleman-street, London, E.C., 28th June, 1878.

GREAT WHEEL ROSS SILVER-LEAD MINE
(LIMITED).

Capital £12,000, in 6000 Shares of £2 each.

5s. on application, and 5s. on allotment.

It is not expected that more than 10s. per share will be required
to make this a good dividend-paying mine.

For prospectuses, reports, and Forms of Application for Shares,
apply to the Secretary, Mr. W. D. MANN.

OFFICES—CARLTON HOUSE, TORQUAY.

WHITSON SILVER-LEAD MINE,
BEERFERRIS, DEVONSHIRE.

Consisting of 64 Shares of £64 each (fully paid up, £4096).

£10 deposit on application, and £54 on allotment.

Conducted upon the Cost-Book System.

Powers are registered in the Cost Book to adopt the Liability Acts 1862 and
1871 to increase the shares in number, and the capital of the company, whenever
deemed desirable by the majority of shareholders.

The advantages of the Cost-Book System are manifest in the conduct of mining
adventure, and especially so in embryo. The practice of late years of loading
speculative and unproven mines with £20,000, £40,000, and in cases £50,000, and
even £100,000 capitalised paid-up shares at starting is not only fraught with dis-
couragement, but possess the certainty of prospective grief and disaster to in-
vestors as under the most auspicious results profits must prove lamentably small
to those who embark.

The Whitson Mine is situated on the bank of the River Tamar, as also are the
Tamar Consols, South Tamar, and the Devon Great Consols. These mines are of
historic fame, and rank among the first prizes of the age, not only in the yield of
rich silver-lead, but also of copper ores.

The property is in the hands of the Right Hon. Earl Mount Edgumbe, and is
held under agreement for lease, acquired purchase, for 21 years, at 1-15th
royalty, at and below the adit level. The sett is traversed by three well-
defined, masterly, and highly mineralised north and south lodes. One of these is
opened upon to a considerable extent, but the workings are comparatively shallow,
and many thousand pounds sterling of rich silver-lead ores wrought and brought
to market. The other two veins are wholly unwrought otherwise than on their
backs, which yield rich specimens of silver lead, and attest their great productiv-
ness in depth. The ores in bulk will yield fully 60 to 70 ozs. of silver, and 72
per cent. of lead to the ton of ore, while gossan deposits yield ores assaying 150
and up to 250 ozs. of silver to the ton of ore.

The vendors have expended about 7000. In acquiring the lease, and they now offer
a limited number of shares at par to bona fide capitalists, 10s. deposit on applica-
tion, and 54s. on allotment. The vendors guarantee a working capital, free from
charge, of 20000. to carry out the preliminary works, which will be conducted
under practical supervision, and in the opinion of authorities and experts discover
a mine worth at least £50,000, and probably second to none throughout the United
Kingdom.

Applications for shares and further particulars to be addressed to R. TREDDINICK,
Consulting Mining Engineer, 66, Coleman street, London, E.C.

THE
LUNKOJ GOLD MINING COMPANY
(LIMITED).

Registered under the Companies Acts of 1862, 1867, and 1877.

Capital £12,000, in 12,000 Shares of £1 each.

Payable, 5s. per share on application, and the remainder in calls not
exceeding 5s. each, at intervals of not less than two months.

Shares may be paid up in full, and such shares will be entitled to
dividends on the amount paid up.

2000 shares will be issued to the vendor as fully paid-up shares,
leaving 10,000 shares to be subscribed for.

DIRECTORS.

CHARLES SAUNDERSON, Esq., Stanmore Lodge, Kilburn.
RICHARD DONAGAN, Esq., 182, Alexandra-road, St. John's Wood.
EDWARD MARSHALL, Esq., Grant House, Chobham, Surrey.

BANKERS—The IMPERIAL BANK (Limited), 6, Lothbury, E.C.

REGISTERED OFFICE—99, GRESHAM STREET, LONDON, E.C.

ABRIDGED PROSPECTUS.

This company has been formed for the purpose of leasing and
working the Upper Lunkoj Gold Mine, situate in Transylvania,
Austro-Hungary.

Mr. C. J. Harvey, mining engineer, and 13 years manager at the
Port Phillip Mine, has thoroughly inspected the Upper Lunkoj pro-
perty, and he estimates that with a battery of 10 heads of stamps
only a yearly profit on the undertaking of about £4500, or nearly
40 per cent., may be relied upon after allowing for expenses at home
and abroad, whilst a proportionately increased profit may be anti-
cipated from any addition to the stamping power.

The consideration to be paid by the company to the vendor for
the acquisition of the agreement for the lease of the mine is as fol-
lows:—£2000 in fully paid up shares, and £400 in cash.

The lease will be for 21 years, from the 1st June instant, upon the
terms stated in the prospectus.

The reason stated by the lessor for having agreed to lease the pro-
perty is that he does not possess sufficient means to develop the
mine in a proper manner.

A large proportion of the capital has already been promised, and
the Subscription List will be closed at an early date. It is, there-
fore, necessary that applications should be promptly made.

The only contracts entered into are those between Joseph Skoupil,
of Thonet-hof, Budapest, Austro-Hungary, of the one part; and John
William Purchase, of 57, Moorgate-street, London, of the other part,
dated 3rd June, 1878; and between the said John William Purchase,
of the one part, and the company of the other part, dated 21st June,
1878. Copies of such contracts, also the Memorandum and Articles
of Association, the engineer's report, and the plan of the mine, can
be seen at the company's office.

In the event of no allotment being made, the deposit will be re-
turned in full.

Prospectuses, with Forms of Application for Shares, can be had
at the company's office.

M R J S M E R R Y,
ASSAYER AND ANALYTICAL CHEMIST,
SWANSEA.

TRESSELLYN TIN MINING COMPANY
(LIMITED).

MR. JOHN DAWE WILL SELL, BY PUBLIC AUCTION, by
order of the Liquidator, on Tuesday, the 9th of July, 1878, at Tressellyn,
in the parish of Altarnun, and other MINERALS under certain lands at Tres-
sellyn, in the parish of Altarnun, near Launceston, in the county of Cornwall.
Such rights are acquired under a sett from John Sargent, Esq., for the term of
twenty-five years, from the 29th day of September, 1871, at the rents thereby re-
served. Together with such water rights from the River Fowey as the company
at present have, and together with the MACHINERY and PLANT upon the
premises.

A large amount of money has been expended upon the mine, and it is believed
a very small additional outlay of capital will make it a very profitable under-
taking.

If not sold as above, the plant will be sold in lots on a subsequent day, to be
fixed by the Auctioneer.

For further particulars, apply to Messrs. WHITLEY and MADDOCK, Solicitors,
6, Water Street, Liverpool; Mr. EDWARD MOUNSEY, Liquidator of the company,
3, Lord-street, Liverpool; or to the Auctioneer, Mr. JOHN DAWE, Trevadock,
Lewannick.

Copies of the lease and grant of water rights may be inspected at the office of
the Auctioneer after the 1st July.

Dated Life and Fire Insurance Office, Lewannick, June 17, 1878.

TO BE SOLD, BY PUBLIC ROUP, within the Faculty Hall,
St. George's-place, Glasgow, on Wednesday, the 11th day of July, 1878, at
Two o'clock in the afternoon, the REMAINDER of the CURRENT LEASE of the
YSTUMTUEN LAD MINE.

Situated in the county of Cardigan and parish of Llanbadaraw, about eleven
miles from Aberystwyth, with relative water rights, and the whole fixed and
movable PLANT and MACHINERY connected with the mine.

The lease is for twenty-one years, from 24th March, 1874, and the rents and
lordships are moderate.

The MACHINERY includes a complete set of PATENT SELF-ACTING
DRESSING MACHINERY in first class working order and condition, consisting
of ONE 35 feet WATER WHEEL, ONE 25 feet WATER WHEEL, ONE TUR-
BINE, four four-compartment jiggers, two three-compartment jiggers, all with
riddles and classifiers complete, one crusher, three round buddles with classifiers,
picking tables, grates, sheds, &c., all complete, and is capable of dressing 45 tons
of ore per day.

For further particulars, apply to JAMES WINK, C.A., 45, St. George's-place,
Glasgow; or to Messrs. DRUMMOND and REID, W.S., 21, Charlotte-square, Edin-
burgh, from either of whom an inventory of the buildings, machinery, &c., may
be had, and the latter of whom are in possession of the leases, articles of roup, &c.
Edinburgh, June, 1878.

TO BE SOLD, BY PUBLIC AUCTION, under Decree of the
Supreme Court of Newfoundland in Equity, in a suit between CHARLES
FOX BENNETT, Plaintiff, and SMITH McKAY and LEANDER GILL, Defendants,
on Monday, the 2nd day of September next, at Twelve o'clock noon (if not pre-
viously disposed of by private sale), at the Court House, in St. John's, Newfound-
land, that VALUABLE COPPER MINE and MINING PROPERTY called and
known as the

UNION MINE.

Situate on the east and west sides of Tilt Cove, on the north side of Notre Dame
Bay or Green Bay, Newfoundland, and near Cape John, with all ERECTIONS,
IMPROVEMENTS, PLANT, and OTHER PROPERTY and EFFECTS thereto
appertaining.

The mine is held under grant in fee from the Government of Newfoundland,
containing two miles in length, by half-a-mile in breadth; a Licence of Occupa-
tion from the said Government, containing one mile square, west of and adjoining
the Crown grant and land held under conveyance of fee-simple interests of
former owners.

The title-deeds and documents, and plans and surveys of the property may be
seen, and further information may be obtained, by application to PRESCOTT
EMERSON, Esq., Q.C., Master-in-Chancery, at his office, in St. John's; or to
either of the undersigned solicitors for the parties, or to either of the parties.

Conditions of sale will be published hereafter.

PRESCOTT EMERSON, Esq., Q.C., Master-in-Chancery,
St. John's, Newfoundland, January 28th, 1878.

For further particulars, apply to C. T. BENNETT, Esq., No. 55, Queen's-square,
Bristol; Messrs. HENRY BATH and SON, Gresham House, London; or to
PILBET and GREENE, Solicitors to the Plaintiff; WINTER and CARTER,
Solicitors for Defendant McKAY.

SPAIN.

VALUABLE CONCESSIONS OF MINING PROPERTIES FOR
SALE OR LEASE, in the Province of Murcia, Spain, containing ZINC,
ARGENTIFEROUS LEAD, and COPPER ORES, &c., situated in the Sierra de
Cartagena, Sierra de Murcia, Sierra de Carrasoy, and Sierra de Espuna—all
within easy distances per road and rail of the ports of Cartagena, Porman Escob-
reras, Mazarron, and Aguilas. Labour cheap. No expensive plant required.

Assays of surface minerals:—Copper, 21 per cent., with 23 ozs. of silver per ton;
lead, 30 per cent. to 80 per cent., with from 5 ozs. to 20 ozs. of silver per ton;
calamine, 30 per cent. to 49 per cent.

Further particulars on application to WILLIAM PAYNTER, Mining and General
Agent, Murcia. First-class references in England.

TO BE SOLD, OR LET, SEVERAL VALUABLE GOLD
MINES, in the neighbourhood of the ST. JOHN DEL REY MINES,
BRAZIL.

Apply to Mr. T. C. KITTO, 5, Ferris Town, Truro.

TO BE SOLD, FIVE 24-inch INGERSOLL ROCK DRILLS,
with PIPING, AIR COMPRESSOR, AIR RECEIVER, BOILER, and
FITTINGS.

Address, "J. C. M.," MINING JOURNAL Office, 26, Fleet-street, London.

FOR SALE, A SLATE QUARRY.

TO INVESTORS.

FOR SALE, THE WHOLE or any portion of A SLATE
QUARRY in DEVONSHIRE (area about 13 acres), only now opened up.
Steam machinery just erected, and all necessary plant on the ground. Satisfac-
tory reasons given for disposal of same.

Apply, Mr. F. H. STANBURY, Solicitor, Princess-square, Plymouth.

TO CAPITALISTS.

A MOIETY in a VALUABLE MINING PROPERTY, with
EXTENSIVE PLANT and MACHINERY, can be obtained on easy
terms, with a view to further development.

For particulars and terms, apply to—
W. W. HOWARD, Auctioneer, Surveyor, &c., St. Columb, Cornwall.

WINDING ENGINES, NEW PRINCIPLE, best and most
compact in the market. Several pairs ready.

PORTABLE WINDING AND SINKING ENGINES, the
cheapest and most convenient and durable.

STEAM CAPSTANS AND HAULING ENGINES. The greatest
power in the space of any made.

HORIZONTAL, VERTICAL, AND PORTABLE ENGINES.
First-class make and low price.

PUNCHING, SHEARING, DRILLING, AND OTHER
MACHINES.

Many of the above secondhand, very cheap.

ALEXANDER SMITH, ENGINEER, THE MIDLAND MACHINERY
STORES.—Offices: PRIOR STREET, DUDLEY.

18 H.P. PORTABLE STEAM ENGINE, with link motion,
reversing gear, ready for delivery; also gear to wind and pump.

A 9-h.p. VERTICAL STEAM ENGINE, with link motion, reversing gear
(winding drum if required).

A 6-ft. PAN MORTAR MILL, VERTICAL ENGINE, and BOILER, with
carriage and travelling wheels.

Apply to—
BARROWS AND STEWART, ENGINEERS, BANE

GLASGOW AND THE HIGHLANDS.

ROYAL ROUTE VIA CRINAN AND CALEDONIAN CANALS
by the new steamer "COLUMBA" or the "IONA," from GLASGOW
DAILY at 7 A.M., and from GREENOCK at 9 A.M., conveying passengers for
NORTH and WEST HIGHLANDS. See bill, with map and tourist fares, free, at
Messrs. CHATTO and WINDUS, Publishers, 74, Piccadilly, London; or by post from
DAVID HUTCHESON and Co., 119, Hope-street, Glasgow.

MR. WILLIAM BRELEMAYER, MINING, CONSULTING
AND CIVIL ENGINEER, U.S. MINERAL SURVEYOR FOR UTAH
AND IDAHO. NOTARY PUBLIC.

Geological examinations; reports on mining properties; surveys, mines, rail-
roads, and canals, and superintends the workings of the same. Prepares esti-
mates and plans for opening and working mines. Expert on mining questions
before the Courts.

Address, "P. O. Box 1157," Salt Lake City, Utah.

MESSRS. J. TAYLOR AND CO.,
MINING ENGINEERS AND INSPECTORS,
86, LONDON WALL, LONDON, E.C.

Have Agents in England, Scotland, Wales, and on the Continent.

DEVON AND CORNISH MINES.—It is worthy of notice that
none of the mines recommended by R. J. R. have failed to yield satisfac-
tory results; and investors will do well to write to the undersigned before invest-
ing, as he has a few shares in some very choice properties to dispose of.

R. J. RUTTER,
MINE BROKER,
5, PYNE'S TERRACE, ST. DAVID'S, EXETER.

MESSRS. W. REYNOLDS AND CO.,
STOCK AND SHARE DEALERS,
87, GRACECHURCH STREET, AND TALBOT COURT,
LONDON, E.C.

EXTRA STRONG

MINING POWDER.

[ESM]

STRENGTH WITHOUT NOXIOUS FUMES.

SAFETY WITH ECONOMY.

AN ALMOST TOTAL ABSENCE OF SMOKE.

This well-known Mining Powder, manufactured by CURTIS'S
and HARVEY, is much superior in strength to the ordinary kinds,
and is altogether free from the serious disadvantage of producing
NOXIOUS GASES. For these reasons it is commonly used in
close underground places, and wherever rapid progress is of great
importance.

It will be found to be particularly suitable for Quarry Work,
where hard and tough rock has to be removed, and for all sub-
aqueous blasting operations.

CAN BE OBTAINED OF ALL DEALERS.

BICKFORD'S PATENT

FOR CONVEYING

CHARGE IN



SAFETY FUSE

WIRE TO THE

BLASTING ROCKS, &c.

Obtained the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1861; at
the "INTERNATIONAL EXHIBITION" of 1862 and 1874, in London; at the
"IMPERIAL EXHIBITION," held in Paris, in 1865; at the "INTERNA-
TIONAL EXHIBITION," in Dublin, 1865; at the "UNIVERSAL EXPOSI-
TION," in Paris, 1867; at the "GREAT INDUSTRIAL EXHIBITION," at Al-
tona, in 1869; TWO MEDALS at the "UNIVERSAL EXHIBITION," Vienna,
in 1873; and at the "EXPOSICION NACIONAL ARGENTINA," Cordova,
South America, 1873.



BICKFORD, SMITH AND CO.,
OF TUCKINGMILL, CORNWALL; ADELPHI
BANK CHAMBERS, SOUTH JOHN-STREET, LIVER-
POOL; and 85, GRACECHURCH-STREET, LONDON,
E.C., MANUFACTURERS AND ORIGINAL

PATENTEES OF SAFETY-FUSE, having been in-
formed that the name of their firm has been attached to
fuse not of their manufacture, beg to call the attention of
the trade and public to the following announcement:—

EVERY COIL of FUSE MANUFACTURED by them has TWO SEPARATE
THREADS PASSING THROUGH the COLUMN of GUNPOWDER, and BICK-
FORD, SMITH, AND CO. CLAIM SUCH TWO SEPARATE THREADS as
THEIR TRADE MARK.

C. H. WALKER AND CO.,

MINING AGENTS AND ENGINEERS,

VALPARAISO AND SAN IAGO,

CHILE.

HENRY SEWELL, M.E.,

318, PINE STREET, ROOM 34,

SAN FRANCISCO.

Cables will reach him by addressing—"Sewell, San Francisco."

Mr. E. JACKSON,

Associate of the Royal School of Mines,

ANALYST AND ASSAYER.

Assays or Complete Analyses made of Copper, Silver, Lead, Zinc, Tin, and
other Ores. ASSAYING TAUGHT.

105, QUEEN VICTORIA STREET, LONDON, E.C.

ENOCH AND RICHARD PARRY,

MINING AGENTS AND SURVEYORS,

MINSTERLEY, SHROPSHIRE.

Mines inspected and reported on at home and abroad.

MEXICO, NEW MEXICO, ARIZONA, UTAH, NEVADA,
AND CALIFORNIA.

F. M. F. CAZIN,

MINING AND CIVIL ENGINEER,

At BERNALLILLO, NEW MEXICO, U.S. OF AMERICA.

Has 24 years' experience in Mining and Smelting, and 10 years' experience in
American Business and Law, offers his services at moderate charges for Reporting
on Mining and Other Property in any of the above-named States or Territories;
gives correct, safe, and responsible advice as to securing full titles and possession;
and, as to best mode of utilising the property, will assist in settling existing diffi-
culties by compromise, and in disposing of developed mining property when held
at real value; offers his assistance for securing undeveloped mining properties at
home prices. As to care taken in reporting, references made to the Mining Journal
Supplement, April 1, 1876, containing report on property of the Maxwell Land
Grant and Railway Company; as to technical standing, to the prominent men of
the trade—compare Mining Journal of Aug. 30 and Nov. 31, 1872, and New York
Engineer and Mining Journal, Feb. 28, 1874.

MR. W. F. STANLEY, MATHEMATICAL INSTRUMENT
MANUFACTURER TO H.M.'S GOVERNMENT, COUNCIL OF INDIA
SCIENCE AND ART DEPARTMENT, ADMIRALTY, &c.

MATHEMATICAL, DRAWING, and SURVEYING INSTRUMENTS of every
description, of the highest quality and finish, at the most moderate prices.

Price-list post free.

ENGINE DIVISION TO THE TRADE.

ADDRESS—GREAT TURNSTILE, HOLBORN, LONDON, W.C.

Just published, cloth limp, price 1s. 6d.,

THE COLLIERY READY-RECKONER AND WAGES
CALCULATOR.

By JAMES IRELAND.

"Will be the means of preventing many disputes between pay clerks and
colliers."—Mining Journal.

To be had on application at the MINING JOURNAL Office, 26, Fleet-street, E.C.

Second Edition. Just published, price 8s. 6d.

A NEW GUIDE TO THE IRON TRADE
OR, MILL MANAGERS' AND STOCK-TAKERS' ASSISTANT;

Comprising a Series of New and Comprehensive Tables, practically arranged to
show at one view the Weight of Iron required to produce Boiler-plates, Sheet-Iron,
and Flat, Square, and Round Bars, as well as Hoop or Strip Iron of any dimen-
sions. To which is added a variety of Tables for the convenience of Merchants,
including a Russian Table.

By JAMES ROSE.
Batman's Hill Ironworks, Bradley, near Bliston.

HUDSWELL, CLARK, & RODGERS,

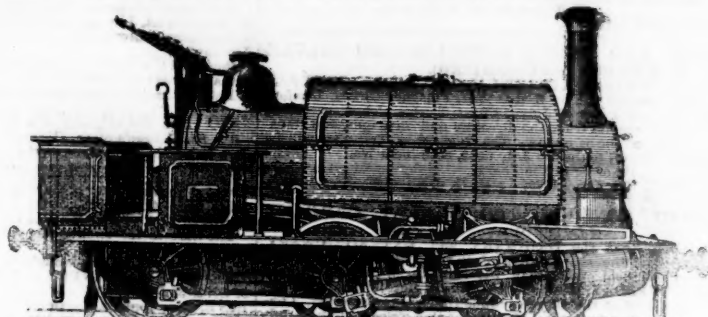
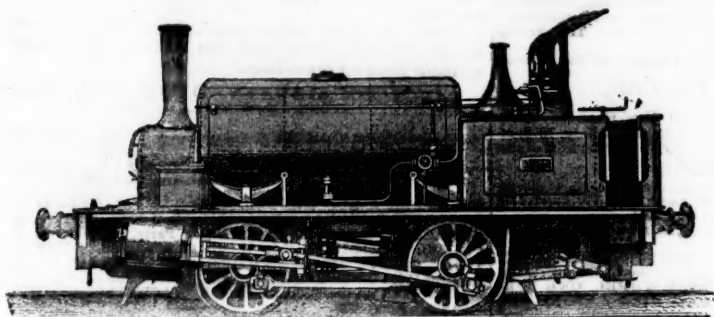
RAILWAY FOUNDRY, HUNSLET, LEEDS,

ARE NOW MAKING A GREATLY IMPROVED
CLASS OF

TANK LOCOMOTIVE,

EITHER ON FOUR WHEELS OR SIX, OF
VARIOUS GAUGES,

IN WHICH EXTRA STRENGTH AND DURABILITY ARE COMBINED WITH SIMPLICITY AND ECONOMY IN REPAIRS.

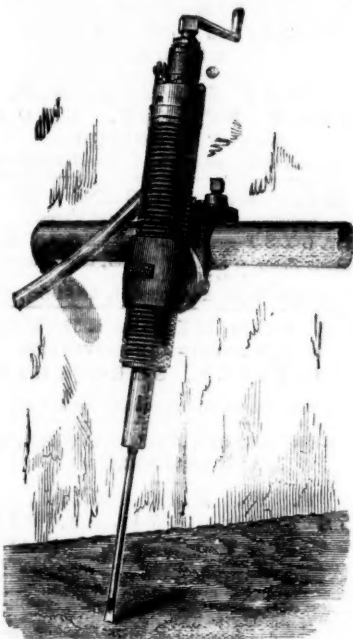


FIRE BOXES—Copper. TUBES—Brass. TYRES—Steel. AXLES—Steel. BOILER PLATES AND MACHINERY of the best Yorkshire Iron. NEW LOCOMOTIVES, with Cylinders 8 in., 10 in., and 13 in. diameter, always in stock or in progress. SECOND-HAND LOCOMOTIVES, of various sizes, FOR SALE OR HIRE. PRICES AND SPECIFICATIONS ON APPLICATION.

"DARLINGTON" ROCK BORER.

NO VALVE.

SCREW, OR CRADLE MOUNTED, BORING MACHINES.

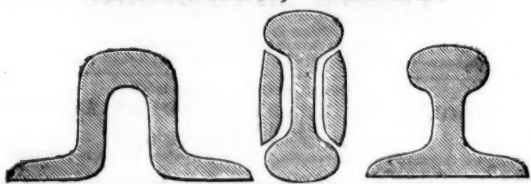


AIR COMPRESSORS, DRIVING AND SINKING APPARATUS.

JOHN DARLINGTON, 2, COLEMAN-STREET-BUILDINGS,
MOORGATE STREET, LONDON, E.C.

JOHN BEATSON & SON,

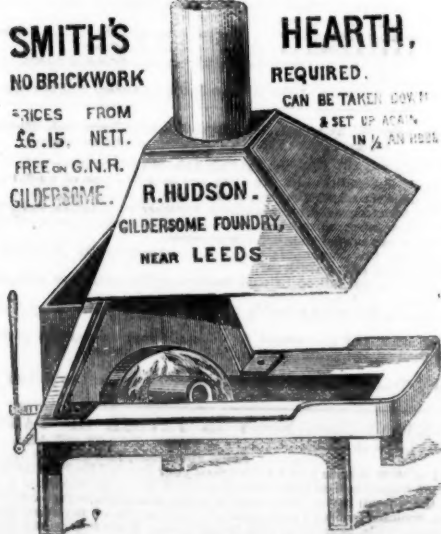
IRONGATE, DERBY.



IRON AND STEEL RAILS, of all sections, from 10 to 82 lbs. per yard, new, defective, or second-hand. POINTS AND CROSSINGS, FISH PLATES, BOLTS, NUTS, CHAIRS, AND SPIKES. DERBYSHIRE, YORKSHIRE, HEMATITE, SCOTCH, AND COLD-BLAST PIG-IRON.

STEEL AND MALLEABLE IRON, of all qualities and sections. Delivered at all Ports and Railway Stations in Great Britain.

IMPROVED IRON



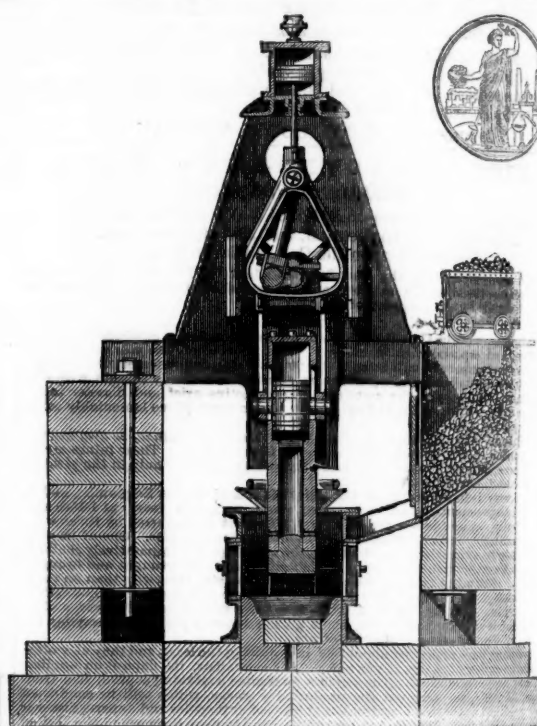
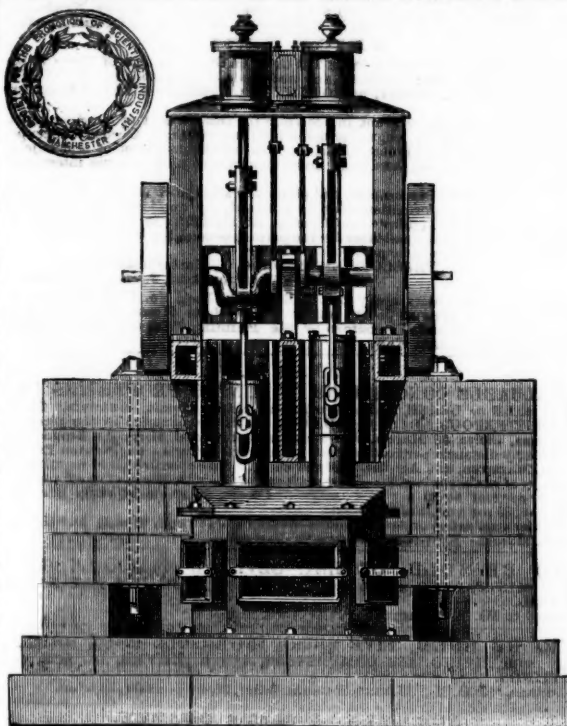
SMITH'S
NO BRICKWORK
HEARTH.
PRICES FROM
£6.15. NETT.
FREE ON G.N.R.
GILDERSCOME.

HEARTH.
REQUIRED.
CAN BE TAKEN DOWN
& SET UP AGAIN
IN 1/2 AN HOUR.

R. HUDSON.
GILDERSCOME FOUNDRY,
NEAR LEEDS

GREAT SAVING IN ROOM.

THE NEWCASTLE DAILY CHRONICLE
(ESTABLISHED 1764.)
THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER
Office, Westgate-road, Newcastle-upon-Tyne; 80, Howard street, North
Shields; 105 High-street, Sunderland.



SHOLL'S PATENT DIRECT-ACTING PNEUMATIC STAMPERS,

For Pulverising Tin and Lead Ores, Gold Quartz, &c.,

SOLE MAKERS FOR CORNWALL,

N. HOLMAN AND SONS,

ST. JUST FOUNDRY, NEAR PENZANCE, CORNWALL.

All objectionable features of "wear and tear" common to the original and existing Pneumatic Stamps (driven by belts) are removed in this patent, and leather glands and stuffing boxes entirely dispensed with, the pneumatic piston being reciprocated into the compressing chambers by direct-action from without. These double machines are guaranteed to be of the capacity of 36 ordinary heads of cam and lifter stamps, and engineers will at once see that, inasmuch as the power is directly applied to its work (without the medium of belts and other gearing), the minimum consumption of coal (all other conditions being equal) must be the result.

The COST OF THESE MACHINES (including boiler) is about ONE-THIRD OF THE ORIGINAL CAM AND LIFTER STAMPS, to do the same work.

ROTARY STAMPERS SUPPLIED ON THE SAME PRINCIPLE, WITHOUT STUFFING BOXES OR GLANDS, WHERE RUNNING GEAR EXISTS, OR WITH HORIZONTAL CONDENSING ENGINES AND BELTS TO DRIVE THEM, IF PREFERRED.

Also, SOLE MAKERS OF STEPHENS' PATENT PULVERISER. MINING AND OTHER MACHINERY CONSTANTLY ON SALE, NEW AND SECOND-HAND.

THOMAS TURTON AND SONS,

MANUFACTURERS OF

MINING STEEL of every description.

CAST STEEL FOR TOOLS. CHISEL, SHEAR, BLISTER, & SPRING STEEL
MINING TOOLS & FILES of superior quality.

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

SHEAF WORKS & SPRING WORKS, SHEFFIELD.

LONDON OFFICES.—90, CANNON STREET, E.C. PARIS DEPOT.—12, RUE DES ARCHIVES.
NEW YORK STORE.—102, JOHN STREET.

THE BIRMINGHAM WAGON COMPANY (LIMITED)

MANUFACTURE RAILWAY CARRIAGES and WAGONS of EVERY DESCRIPTION, for HIRE and SALE, by immediate or deferred payments. They have also wagons for hire capable of carrying 6, 8, and 10 tons, part of which are constructed specially for shipping purposes. Wagons in working order maintained by contract. MANUFACTURERS also of IRONWORK, WHEELS, and AXLES. EDMUND FOWLER, Managing Director.

WAGON WORKS, SMETHWICK, BIRMINGHAM.

DEBILITY AND NERVOUSNESS.
Free Edition, 152 pages, post free, in envelope, two stamps. The
WARNING VOICE.—A Special Medical Book for Young Men
on the Cause, Consequences, and Treatment of certain forms of Debility
and Nervousness, viz.—Mental and Physical Depression, Palpitation of the Heart,
Noises in the Head and Ears, Impaired Sight and Memory, Indigestion, Pain
the Back, Headache, Piles, Constipation, Hysteria, Dizziness, Local Weakness,
Muscular Relaxation, Nervous Irritability, Blushing, &c., resulting from Exhaustion
of Nerve Power, effect of Overwork, City Life, Worry, Brain Toil, Excess
perance, and other abuses of the system.
Address, Dr. H. SMITH, 8, Burton Crescent, London, W.C.

NOBEL'S DYNAMITE

Is the MOST ECONOMICAL and POWERFUL EXPLOSIVE for every kind of MINING and QUARRYING OPERATIONS; for blasting in hard or soft, wet or dry ROCKS; for clearing land of TREE ROOTS and BOULDER STONES; for rending massive BLOCKS of METAL; for SUBAQUEOUS and TORPEDO purposes; and for recovering or clearing away of WRECKS, &c.

ITS SAFETY is evidenced by the total ABSENCE OF ACCIDENTS in transit and storage; it is insensible to heavy shocks its GIANT POWER being only fully developed when fired with a powerful percussion detonator, and hence its great safety.

As a SUBSTITUTE FOR GUNPOWDER its advantages are the GREAT SAVING OF LABOUR, rapidity and INCREASE OF WORK done, FEWER and smaller BORE-HOLES required, greater depth blasted, safety in use NO DANGER FROM TAMPING, absence of smoke and explosive properties, unaffected by damp, &c.

For information, apply to the—

NOBEL'S EXPLOSIVES COMPANY (LIMITED), GLASGOW;
OR AT THE

London & Export Office, 85, GRACECHURCH STREET, LONDON E.C.

TONITE, OR COTTON POWDER.

THE SAFEST, STRONGEST, AND CHEAPEST OF ALL EXPLOSIVES.

Recommended to MINERS, PIT SINKERS, QUARRYMEN, and CONTRACTORS as the MOST EFFICIENT and ECONOMICAL BLASTING AGENT ever invented.

Results of practical experience show a saving of from 15 to 20 per cent. over the strongest explosives previously in use.

It saves labour in drilling holes, as a less number of holes are needed.

It does not require thawing, but is ready for use at all temperatures and in all climates.

It can also be advantageously used in breaking up boulders, extracting stumps, removing wrecks, exploding torpedos, and for submarine purposes in general, as well as for signal lights and fog signals for ships.

OFFICES:

23, QUEEN ANNE'S GATE, LONDON, S.W.

WORKS: FAVERSHAM, KENT.

Agents DINEEN, SON, and Co., Leeds; JOHN RUSSELL, Whitehaven; R. J. CUNNACK, Helston, Cornwall; J. and W. SMITH, Chapel-en-le-Frith; W. VEITCH, Jedburgh, N.B.

LITHOFRACTEUR.

THE BEST EXPLOSIVE KNOWN FOR EVERY KIND OF QUARRYING, MINING, TUNNELLING, AND SUBAQUEOUS OPERATIONS.

UNRIVALLED FOR STRENGTH, SAFETY, AND FREEDOM FROM GASES.

EXPORT ORDERS DELIVERED FREE ON BOARD IN THE THAMES. PAMPHLETS ON APPLICATION.

Responsible Agents for the Country Districts can apply to—

KREBS BROTHERS AND CO., Sole Manufacturers and Patentees,
22, BASINGHALL STREET, LONDON, E.C.

W. J. SEYD, Agent

THE TUCKINGMILL FOUNDRY COMPANY

(TUCKINGMILL FOUNDRY AND ROSEWORTHY HAMMER MILLS),

CAMBORNE, CORNWALL,

Engineers, Iron and Brass Founders, &c.,

MAKERS OF EVERY DESCRIPTION OF

MINING MACHINERY, SHOVELS, GEARWORK,
PUMPING, WINDING, AND STAMPING ENGINES.

ALSO OF

BLAKE'S STONE BREAKERS.

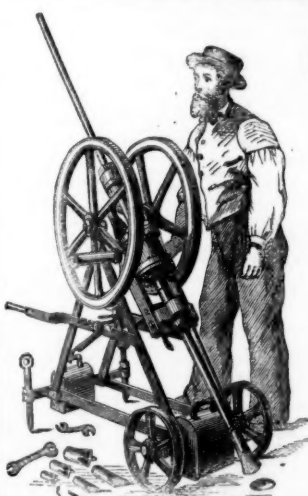
SOLE MAKERS OF

BORLASE'S PATENT ORE-DRESSING MACHINES AND PULVERISERS.

ESTIMATES GIVEN UPON INDENTS AND SPECIFICATIONS.

ILLUSTRATED CATALOGUES POST FREE ON APPLICATION.

LONDON OFFICE: 85, GRACECHURCH STREET, E.C.



PATENT HAND-POWER ROCK DRILL.

IMMENSE SAVING.

STEAM POWER AND SKILLED LABOUR DISPENSED WITH.

PRICE COMPLETE, £50.

FOR SINKING, DRIVING, AND OPEN QUARRY WORK.

"TIMES," November 29th, 1877.

"Enough was done to demonstrate that the machine was well calculated to take its place in mining and quarrying operations, and to successfully supersede for most purposes the slow and tedious process of hand boring."

Testimonial received from Messrs. JOHN TAYLOR and SONS, 6, Queen-street-place, E.C.

"DEAR SIR,—I have much pleasure in letting you know that the hand-power rock drill, which you have supplied to our works at Colicron, near Nantes, seems likely to prove a very useful implement in our granite quarries. Our engineer reports that it bores 1½ hole in granite at the rate of 1 inch per minute, worked by two men. No difficulty is found by them in keeping up continuously that rate, a third man relieving one of the others from time to time.

"January 17, 1878.

Yours very truly,

(Signed)

RICHARD TAYLOR."

Machines can be seen at work on application to the

HAND-POWER ROCK DRILL COMPANY (LIMITED).

T. B. JORDAN, SON, & MEIHE,

ENGINEERS AND CONTRACTORS

For General Mining and Agricultural Machinery, Turbines, Water Wheels, Engines, Boilers, Pumps, Cranes, &c.

63, QUEEN VICTORIA STREET, LONDON, E.C.

ADJOINING MANSION HOUSE STATION.

* * * ILLUSTRATED Catalogues in English and French on application.

CLARKE AND SUTCLIFFE,

CLARKE'S IMPROVED SCHIELES' PATENT

BLAST AND EXHAUST FANS,

AND MINE VENTILATORS,

SCHIELES' PATENT TURBINES,

SLATE PLANING,

AND

SAWING MACHINES.

IMPROVED EXCELSIOR

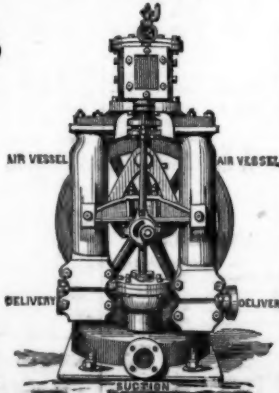
DOUBLE-ACTING STEAM-RAM PUMP.

UNION IRONWORKS,

Rochdale Road, Manchester,

LATE

THE UNION ENGINEERING COMPANY, LIMITED.



"Kainotomon" Rock Drill

SELECTED BY THE

BRITISH, PRUSSIAN, & SAXON
GOVERNMENTS.

SUPERIOR
Air-Compressors, Coal-
Cutters, Pumps, and all
Mining Machinery.



Secondhand ROCK DRILLS
BRYDON AND DAVIDSON'S
make £25 each new £32

T. A. WARRINGTON,
30, King-street, Cheapside,
LONDON E.C.

JOHN TAYLOR & CO.,

MANUFACTURERS OF

Single and Double Leather
Machine Belting.

Copper Riveted Leather Hose
Pipes.

India Rubber Valves, Sheet,
Washers, Belting, Hose Pipes, Packing, &c., &c.

Gutta Percha Pump Buckets,
Round and Flat Bands, Tube, Sheet, &c., &c.

Brattice Cloth, Roofing and Hair
Felt.

Harness Leather, Engine Bends,
Hippopotamus and Walrus Hides, and every description of
Leather used in Collieries and Mines.

Warehouse: 12, Dean-street, Newcastle-on-Tyne.

Works: Dean Court, ditto

CRAVEN AND SPEEDING BROS.,

MANUFACTURERS OF EVERY DESCRIPTION OF

WIRE AND HEMP ROPES

FOR

COLLIERIES, RAILWAYS AND SHIPPING, &c.

Charcoal and Steel Wire Ropes (Flat and Round), of best
selected Charcoal and Steel Wire.

Guide Rods.

Galvanised Wire Signal Cord.

Galvanised and Plain Strand for Fencing.

Galvanised Wire Rope for Ships' Rigging.

Chains, Wire Rope Pulleys, Brattice Cloth, &c., &c.

Hemp Crab Ropes, of best selected Petersburg and Italian Hemp

Ditto Flat Ropes ditto ditto

Ditto Cordage ditto ditto

Manilla Rope, White and Tarred.

Flax Spun Yarn and Dressed Flax, for Packing.

Brown and White Spun Yarn.

Fine Dressed Petersburg and Italian Hemp, &c., &c.

Ships Rigging fitted to order. Estimates and special quotations
supplied on application to

CRAVEN & SPEEDING BROS.

Wear Hemp and Wire Rope Works,
SUNDERLAND.



By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

HEPBURN AND GALE,

TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE

MANUFACTURERS,

LONG LANE, SOUTHWARK, LONDON

Prize Medals, 1851, 1855, 1863, for

MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

LOW PRICES OF METALS. —
In consequence of the present miserably LOW PRICES OF METALS, I have REDUCED the PRICES of my MINING MAPS. The "MAP OF CAMBORNE, ILLOGAN, REDRUTH, AND GWENNAP," published at 2s., I will send per book post (free) on receipt of 6s. 3d. "SAINT AGNES DISTRICT," same price. R. SYMONS, 11, PARADE, TRURO.

MAPS OF THE MINES, AND OF UTAH TERRITORY.

FROISETH'S NEW AND REVISED MAP FOR 1875.—

Size 40 by 56 inches, scale 8 miles to the inch. Handsomely engraved, coloured in counties, showing the Towns, Settlements, Rivers, Lakes, Railroads, Mining Districts, &c., throughout the Territory, and all the Government Surveys to date. Mounted on cloth, £2; half-mounted, £1 12s.; pocket form, £1.

Also, GENERAL MINING MAP OF UTAH, showing twenty-eight of the principal Mining Districts adjacent to Salt Lake City, and location of the most prominent mines. Price, pocket form, 6s.

Also, NEW MAP OF LITTLE AND BIG COTTONWOOD MINING DISTRICTS, showing the location of over Four Hundred Mines and Tunnel Sites, together with the Mines Surveyed for United States Patent. Price, sheets, 6s.; pocket form, 6s.

For sale, and supplied by—

TRUBNER and Co., 57 and 59, Ludgate Hill, London; or

B. A. M. FROISETH, Salt Lake City, Utah, U.S.

THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
1500	Alderley Edge, c. Cheshire*	10 0 0	1	1/4	12 11 8	0 8 0	Nov. 1876
4000	Brookwood, c. Buckfastleigh	1 10 0	1	1/4	3 16 0	0 2 0	Nov. 1876
3000	Bryn Alyn, c. Denbigh	10 0 0	1	1/4	0 7 0	0 7 0	Jan. 1877
400	Cashwell, c. Cumberland*	2 10 0	2 1/2	1 1/2	1 9 6	0 2 0	Aug. 1876
1000	Carn Brea, c. t. Illogan*	36 7 8	42 1/2	39 41	308 0 0	1 0 0	Feb. 1874
2450	Cook's Kitchen, c. t. Illogan*	24 4 9	1 1/2	1 1/2	11 17 0	0 7 6	Jan. 1877
1240	Devon Gt. Consols, c. Tavistock*	1 0 0	3	2 1/2	114 15 0	0 5 0	July 1877
4296	Dolcoath, c. t. Camborne	10 14 10	31	19 31	112 11 3	0 5 0	June 1878
5000	East Black Craig, c. t. Scotland	5 0 0	—	—	0 10 0	0 10 0	Feb. 1877
300	East Darron, c. t. Cardiganshire	22 0 0	—	—	236 10 0	1 0 0	Aug. 1876
6400	East Pool, c. t. Illogan	0 9 9	9 1/2	9 1/2	15 9 3	0 2 6	May 1878
4000	Glasgow Carr, c. t. 130,000 21 p., 10,000 15 p.	1 1/2	1 1/2	1 1/2	0 13 4	0 0 6	Feb. 1878
7500	Gorred and Merlyn Cons., c. t. Flint	2 10 0	4 1/2	4 1/2	0 5 0	0 5 0	Aug. 1877
10000	Great Dylife, c. t. Montgomery	4 0 0	3	3	0 2 6	0 2 6	Apr. 1876
15000	Great Lacey, c. t. t. Penryn	5 18 6	19	17 1/2	23 11 0	0 8 0	Apr. 1878
615	Gt. Retallack, c. t. t. Penryn	1 0 0	1 1/2	1 1/2	0 1 6	0 1 6	Mar. 1874
6400	Green Hurth, c. t. Durham	0 5 0	1 1/2	1 1/2	1 18 0	0 3 0	Mar. 1878
3000	Groswinlon, c. t. Cardigan*	2 0 0	2 1/2	2 1/2	0 14 0	0 2 0	Jan. 1878
9830	Gunnislake (Clitters), c. t. t.	5 6 0	2 1/2	2 1/2	0 18 0	0 1 0	Oct. 1876
6000	Holmshurst, c. t. c. s. t. Callington*	1 0 0	1 1/2	1 1/2	0 4 6	0 0 6	Sept. 1877
2000	Isle of Man, c. t. t. Isle of Man*	25 0 0	—	—	82 5 0	0 10 0	Feb. 1876
8000	Leadhills, c. t. Lanarkshire	6 0 0	—	—	0 15 0	0 3 0	Mar. 1878
400	Lisbane, c. t. Cardiganshire	18 15 0	65	3 1/2	588 10 0	1 0 0	May 1878
14000	Llanidloes, c. t. Montgomery	3 0 0	1 1/2	1 1/2	0 9 0	0 4 6	Nov. 1876
9000	Marke Valley, c. t. Linkinhorne	5 3 6	—	—	7 18 0	0 2 0	Jan. 1878
10000	Mellancor Copper, Hayle*	2 0 0	3 1/2	3 1/2	0 2 0	0 2 0	Jan. 1878
9000	Minera Mining Co., c. t. Wrexham*	5 0 0	14	3 1/2	67 18 2	0 2 6	May 1878
9000	Minning Co. of Ireland, c. t. t.	7 0 0	—	—	23 17 6	0 2 6	Jan. 1878
444	North Bury, c. t. Chacewater	3 9 6	—	—	1 10 0	0 1 0	July 1877
10289	North Hendre, c. t. Wales	2 10 0	—	—	2 7 8	0 5 0	June 1878
8000	Panty Mwyn, c. t. Mold (8794 iss.)	2 0 0	—	—	0 1 0	0 1 0	Feb. 1877
6000	Pedn-ar-dra Con., c. t. Redruth	0 8 6	—	—	0 9 0	0 9 0	June 1877
5000	Pennalls, c. t. St. Agnes	3 2 6	1	1 1/2	0 10 0	0 2 0	July 1878
6000	Pennant, c. t. bar, North Wales*	5 0 0	5	4 1/2	0 10 0	0 5 0	Mar. 1878
45795	Penrthall, c. t. c. t. Gwynedd	2 0 0	6 1/2	3 1/2	0 2 8	0 5 0	Nov. 1876
14000	Prince Patrick, c. t. s. t. Holywell	1 0 0	2 1/2	1 1/2	0 14 0	0 1 8	Jan. 1878
10000	Red Hook, c. t. Cardigan	2 0 0	2 1/2	2 1/2	0 4 0	0 2 0	Jan. 1878
12000	Roman Gravel, c. t. Salop*	7 10 0	8	7 1/2	7 15 0	0 5 0	Mar. 1878
512	South Cardon, c. t. St. Cleer	1 6 0	65	60 65	742 10 0	1 0 0	Mar. 1878
8128	South Condurrow, c. t. c. t. Camborne	6 6 6	11 1/2	11 1/2	3 13 0	0 8 0	Apr. 1878
19000	So. Pr. Patrick, c. t. s. t. (5000 sh. issued)	1 0 0	3	3	0 6 0	0 3 0	July 1877
13000	Tankerville, c. t. Salop*	6 0 0	4 1/2	3 1/2	4 17 0	0 1 0	Oct. 1876
6000	Tinroft, c. t. t. Pool, Illogan*	9 0 0	11	10 11	50 8 0	0 5 0	Jan. 1877
1500	Van, c. t. Llanidloes*	4 5 0	24	22 23	22 15 6	0 12 0	Jan. 1878
3000	W. Chiverton, c. t. Penryn	12 10 0	10	8 1/2	55 10 0	0 10 0	Feb. 1878
1782	West Polioe, c. t. St. Day	10 0 0	—	—	1 19 0	0 4 0	July 1876
512	West Polioe, c. t. Redruth	95 10 0	62	59 61	23 6 0	0 2 6	May 1878
2048	West Wheel Franks, c. t. Illogan	28 1 3	3	2 1/2	3 12 6	0 5 0	Oct. 1876
600	West Wheel Franks, c. t. Camborne	47 0 0	14	12 14	445 0 0	0 15 0	Apr. 1878
13000	West Wye Valley, c. t. Montgomery	3 0 0	3	2 1/2	0 12 0	0 1 0	Apr. 1877
1024	W. Eliza Consols, c. t. St. Austell	18 0 0	—	—	18 0 0	0 1 0	Apr. 1877
2048	Wheel Jane, c. t. Kea	2 15 0	1 1/2	1 1/2	8 5 0	0 5 0	July 1876
4295	Wheel Kitty, c. t. St. Agnes	5 4 6	1 1/2	1 1/2	11 19 0	0 2 6	Dec. 1874
25300	W. Newton, c. t. c. s. t. Calstock	1 0 0	1 1/2	1 1/2	0 11 6	0 5 0	Sept. 1877
80	Wheel Owles, c. t. St. Just	58 15 0	35	30 35	622 10 0	4 0 0	Aug. 1872
3000	Wheel Pevor, c. t. Redruth	7 11 0	6 1/2	6 1/2	0 5 0	0 5 0	Apr. 1878
6000	Wheel Prussia, c. t. Redruth	0 5 0	6 1/2	6 1/2	0 4 0	0 1 0	July 1877
10000	Wye Valley, c. t. Montgomery*	3 0 0	2	1 1/2	0 10 0	0 4 6	Oct. 1876

FOREIGN DIVIDEND MINES.

25400	Alamillos, <i>l</i> , Spain*	3 0 0	1 1/2	1 1/2	1 19 3	0 1 0	April 1878
80000	Almaden and Tinto Consol., c. t.	1 0 0	3 1/2	3 1/2	0 6 3	0 1 0	April 1878
30000	Australian, c. t. South Australia	7 7 8	2	1 1/2	0 19 6	0 1 6	July 1876
10000	Battle Mountain, c. t. (240 part pd.)	5 0 0	—	—	0 10 0	0 10 0	Nov. 1877
18000	Birdseye Creek, c. t. California	4 0 0	1	3/4	0 14 0	0 2 6	Nov. 1876
20000	Cedar Copper Mining, c. t. So. Africa	7 0 0	34	50 32	31 7 6	0 1 6	June 1878
24438	Cedar Creek, c. t. California	8 0 0	—	3 1/2	0 6 0	0 2 6	June 1878
35000	Cesena Sul. Co., Romagna, Italy*	10 0 0	—	—	0 10 0	0 3 0	Aug. 1877
15000	Chicago, c. t. Utah	10 0 0	1	3/4	0 2 8	0 4 0	Nov. 1876
65000	Colorado United, c. t. Colorado*	5 0 0	6 1/2	5 1/2	0 13 6	0 4 0	Jan. 1878
10000	Copio, c. t. Chile (240 shares)	18 15 0	—	—	7 11 5	0 3 0	May 1877
60000	Don Pedro North of the Rey*	0 18 0	—	3 1/2	2 8 0	0 2 0	Mar. 1877
25300	Eberhard & Aurora, c. t. Nevada*	10 0 0	1 1/2	1 1/2	1 8 0	0 3 0	Dec. 1877
10000	English & Australian, c. t. B. Aust.	2 10 0	1 1/2	1 1/2	2 15 0	0 1 0	Mar. 1877
30000	Flagstaff, c. t. Utah	10 0 0	—	—	4 2 0	0 5 0	July 1877
25000	Fortuna, <i>l</i> , Spain*	2 0 0	5 1/2	4 1/2	6 19 0	0 5 0	April 1878
50000	Frontino & Bolivia, c. t. New Gran.	2 0 0	2 1/2	1 1/2	0 2 4	0 1 0	June 1876
20000	Gold Run, <i>hyd.</i>	1 0 0	—	—	0 2 4	0 4 0	Oct. 1872
88000	Kapunda Mining Co. Australia	1 3 0	—	—	0 2 4	0 2 4	June 1878
30000	Last Chance, c. t. Utah	5 0 0	1 1/2	1 1/2	0 14 0	0 2 0	July 1878
10000	Linares, <i>l</i> , Spain*	3 0 0	5 1/2	5 1/2	17 7 10	0 5 0	April 1878
84000	London and California, c. t.	2 0 0	—	—	0 1 0	0 1 0	July 1876
7837	Lusitania, Portugal* (25 sh.)	3 10 0	—	3 1/2	0 5 0	0 1 6	Mar. 1878
5000	Manan Copperopolis of Utah, c. t.	10 0 0	—	—	0 4 0	0 5 0	Dec. 1872
5000	Mountain Chief, c. t. Utah	10 0 0	—	—	0 5 0	0 5 0	Jan. 1878
10000	Pontigaud, c. t. France	20 0 0	3 1/2	25 27	25 8 0	1 1 0	Nov. 1877
100000	Port Phillip, c. t. Clunes*	1 0 0	—	3 1/2	1 10 0	0 1 0	Jan. 1878
50000	Richmond Consols, c. t. Nevada*	5 0 0	12 1/2	12 1/2	4 11 6	0 7 6	May 1878
40000	Santa Barbara, c. t. Brazil	1 0 0	1 1/2	1 1/2	0 4 8	0 1 0	Apr. 1878
12000	Scottish Australian Mining Co. t.	0 10 0	2	1 1/2	15 per cent.	—	May 1878
80000	Scottish Austral. Mining Co., New	1 0 0	—	3 1/2	15 per cent.	—	May 1878
112500	Sierra Buttes, c. t. California*	2 0 0	2	1 1/2	0 18 0	0 2 0	Nov. 1877
60000	South Aurora, c. t. Nevada*	5 0 0	3 1/2	3 1/2	0 14 2	0 2 0	Nov. 1877
253000	St. John del Rey* (25 stock & multiples dealt in)	200 300 x d	—	—	0 11 6	0 6 6	May 1878
20000	Tollima, c. t. So. America	5 0 0	—	—	0 12 0	0 7 1/2	Jan. 1878
25000	Victoria (London), c. t. Australia	1 0 0	3 1/2	3 1/2	0 12 0	0 12 0	Jan. 1878
15000	Western Andes, c. t. New Granada	5 0 0	—	—	1 8 0	0 4 0	Jan.
91300	W. Prussian (500 pref. sh. 101. pd)	10 0 0	11	10 1/2	—	—	—

NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.	Last Call.	5000
5000	Angulla Phosphate, West Indies (4000 issued)	10 0 0	—	—	—	4200
12000	Argentine, c. t. Argentine Republic	5 0 0	—	—	—	600
3000	Bellavista, c. t. Peru* (410 shares)	10 0 0	—	—	—	3000
20000	Blue Tent, c. t. California	10 0 0	—	—	—	3000
49935	Chontales, c. t. Nicaragua*	5 0 0	3 1/2	3 3/4	—	512
16000	Condes de Chili, c. t.	2 0 0	—	—	—	5000
30000	English Australian, c. t. Victoria*	5 0 0	1 1/2	1 1/2	—	18000
25000	Exeter Hydraulic Gold Washing Co., California*	1 0 0	—	—	—	6000
100000	Exchequer, c. t. California*	1 0 0	—	—	—	937
40000	Holcombe Valley, c. t. California	1 0 0	2s.	1s. 2s.	—	4500
8000	Hornachos, c. t. Spain	1 0 0	—	—	—	6000
12000	Hultsfall, c. t. Orebro, Sweden	10 0 0	—	14	15 16	10000
12000	Hunter Consolidated, c. t. Utah	5 0 0	—	5	4 5	8000
20000	Imperial Brazilian Collieries, Brazil*	10 0 0	—	—	—	16000
90000	I. L. c. t. California*	1 0 0	—	—	—	30000
60000	Javali, c. t. Nicaragua*	2 0 0	—	—	—	6400
2500	La Mancha, c. t. Newfoundland	10 0 0	—	9s.	7s. 9s.	14000
12000	Lanston, c. t. c. t. Victoria, Spain (25 shares)	1 15 0	—	—	—	10000
75000	Malabar, c. t. Colombia* (57155 issued)	1 0 0	—	—	—	10000
40000	Manzano, c. t. Colombia* (7400 pref. shares, fully paid)	1 0 0	—	—	—	6000
12000	Meisenberg, c. t. Honnet, Germany*	6 6 0	—	—	—	12000
4588	New Bonberg, c. t. Germany	5 0 0	—	—	—	10000
60000	New Quebrada, c. t. Venezuela	5 0 0	—	—	—	20000
20000	New Zealand Kapanga, c. t. Coromandel*	5 0 0	—	1 1/2	1 1/2 1 1/2	1000
3000	Oregon, c. t. Oregon, U.S. (preference shares)	4 0 0	—	—	—	—
80000	Panulillo, c. t. Chile* (250000 debentures)	4 0 0	—	—	—	—
50000	Pastana United, c. t. Italy*	4 0 0	—	—	—	—
50000	Providencia and New Rosario, c. t. Mexico*	3 0 0	—	—	—	—
5 000	Rio, c. t. Colombia* (40000 issued)	1 0 0	—	—	—	—
22,151,000	Rio Tinto, c. t. Huera, Spain	1 0 0	—	—	—	—
100000	Rosa Grande, c. t. Brazil* (41 shares)	10 0 0	—	—	—	—
20000	Russia Copper, Orenburg and Ufa*	0 19 0	—	—	—	—
30000	San Pedro, c. t. Chile*	10 0 0	—	—	—	—
10000	Silver Plume, c. t. Colorado*	2 0 0	—	—	—	—
30000	Tecoma, c. t. Utah*	1 0 0	—	—	—	—
43174	United Mexican, c. t. Mexico*†1	10 0 0	—	—	—	—
14000	Utah, c. t. Utah*	50 0 3	—	—	—	—
60000	Virkeberg, c. t. Rheinbreitbach, Germany* (25 shares)	5 0 0	—	—	—	—
15000	Yorke Peninsula, c. t. South Australia	1 15 0	—	—	—	—
40000	Yorke Peninsula, c. t. South Australia Preference	1 0 0	—	—	—	—

* Have made calls since last dividend was paid.

FOREIGN AND MISCELLANEOUS STOCKS, BONDS, LOANS, AND TRUSTS.

CLOSING PRICES				CLOSING PRICES			
Argentina, 1888, 6 percent.	76	78		Foreign and Col. Gov. Trust, 6 p. cent.	70	75	
Bolivia, 6 per cent.	26	27		Do., 6 per cent., 2d issue	67	62	
Brazilian, 1868, 5 per cent.	93	97		Do., 6 per cent., 2d issue	67	62	
Chilean, 1866, 7 per cent.	103	105		Do., 1872, 4th issue	60	63	
City of Providence, 5 p. coupon bonds	103	105		Do., 1872, 5th issue	60	63	
Egyptian, Gov. preference	71 1/4	72 1/4		Peruvian, 1870, 6 per cent.	15	60	
Do., unified debt, scrip	71 1/4	72 1/4		Do., 1872, 6 per cent.	16 1/2	16 1/2	
Do., 7 per cent., V.M.L.	79	81		Russian, 8 1/2 per cent. L. M.	14	14 1/2	
Do., 9 per cent. guar.	78	82		Spanish, Quiksilver Mort., 5 p. cent.	90	101	
Do., K. Dain Sanich	80	82		United			